

Exhibit

F

FOLDER 1

Pt. 2

CONDITIONS APPLICABLE TO ALL VPDES PERMITS

A. Monitoring.

1. Samples and measurements taken as required by this permit shall be representative of the monitored activity.
2. Monitoring shall be conducted according to procedures approved under Title 40 Code of Federal Regulations Part 136 or alternative methods approved by the U.S. Environmental Protection Agency, unless other procedures have been specified in this permit.
3. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will insure accuracy of measurements.

B. Records.

1. Records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling or measurements;
 - c. The date(s) and time(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The analytical techniques or methods used; and
 - f. The results of such analyses.
2. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years, the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the permittee, or as requested by the Board.

C. Reporting Monitoring Results.

1. The permittee shall submit the results of the monitoring required by this permit not later than the 10th day of the month after monitoring takes place, unless another reporting schedule is specified elsewhere in this permit. Monitoring results shall be submitted to:

Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060

2. Monitoring results shall be reported on a Discharge Monitoring Report (DMR) or on forms provided, approved or specified by the Department.
3. If the permittee monitors any pollutant specifically addressed by this permit more frequently than required by this permit using test procedures approved under Title 40 of the Code of Federal Regulations Part 136 or using other test procedures approved by the U.S.

Environmental Protection Agency or using procedures specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or reporting form specified by the Department.

4. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

D. Duty to Provide Information.

The permittee shall furnish to the Department, within a reasonable time, any information which the Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Board may require the permittee to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

E. Compliance Schedule Reports.

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Unauthorized Discharges.

Except in compliance with this permit, or another permit issued by the Board, it shall be unlawful for any person to:

1. Discharge into state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances; or
2. Otherwise alter the physical, chemical or biological properties of such state waters and make them detrimental to the public health, or to animal or aquatic life, or to the use of such waters for domestic or industrial consumption, or for recreation, or for other uses.

G. Reports of Unauthorized Discharges.

Any permittee who discharges or causes or allows a discharge of sewage, industrial waste, other wastes or any noxious or deleterious substance into or upon state waters in violation of Part II F; or who discharges or causes or allows a discharge that may reasonably be expected to enter state waters in violation of Part II F, shall notify the Department of the discharge immediately upon discovery of the discharge, but in no case later than 24 hours after said discovery. A written report of the unauthorized discharge shall be submitted to the Department, within five days of discovery of the discharge. The written report shall contain:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;
4. The length of time that the discharge continued;
5. The volume of the discharge;
6. If the discharge is continuing, how long it is expected to continue;

7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

Discharges reportable to the Department under the immediate reporting requirements of other regulations are exempted from this requirement.

H. Reports of Unusual or Extraordinary Discharges.

If any unusual or extraordinary discharge including a bypass or upset should occur from a treatment works and the discharge enters or could be expected to enter state waters, the permittee shall promptly notify, in no case later than 24 hours, the Department by telephone after the discovery of the discharge. This notification shall provide all available details of the incident, including any adverse affects on aquatic life and the known number of fish killed. The permittee shall reduce the report to writing and shall submit it to the Department within five days of discovery of the discharge in accordance with Part II I 2. Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

1. Unusual spillage of materials resulting directly or indirectly from processing operations;
2. Breakdown of processing or accessory equipment;
3. Failure or taking out of service some or all of the treatment works; and
4. Flooding or other acts of nature.

I. Reports of Noncompliance

The permittee shall report any noncompliance which may adversely affect state waters or may endanger public health.

1. An oral report shall be provided within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which shall be reported within 24 hours under this paragraph:
 - a. Any unanticipated bypass; and
 - b. Any upset which causes a discharge to surface waters.
2. A written report shall be submitted within 5 days and shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
 - c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The Board may waive the written report on a case-by-case basis for reports of noncompliance under Part II I if the oral report has been received within 24 hours and no adverse impact on state waters has been reported.

3. The permittee shall report all instances of noncompliance not reported under Parts II I 1 or 2, in writing, at the time the next monitoring reports are submitted. The reports shall contain the information listed in Part II I 2.

NOTE: The immediate (within 24 hours) reports required in Parts II G, H and I may be made

to the Department's Piedmont Regional Office at (804) 527-5020 (fax 804-527-5106) and this shall fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Services maintains a 24 hour telephone service at 1-800-468-8892.

J. Notice of Planned Changes.

1. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
 - a. The permittee plans alteration or addition to any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:
 - (1) After promulgation of standards of performance under Section 306 of Clean Water Act which are applicable to such source; or
 - (2) After proposal of standards of performance in accordance with Section 306 of Clean Water Act which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal;
 - b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations nor to notification requirements specified elsewhere in this permit; or
 - c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
2. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

K. Signatory Requirements.

1. Applications. All permit applications shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

- b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - c. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a public agency includes: (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
2. Reports, etc. All reports required by permits, and other information requested by the Board shall be signed by a person described in Part II K 1, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- a. The authorization is made in writing by a person described in Part II K 1;
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and
 - c. The written authorization is submitted to the Department.
3. Changes to authorization. If an authorization under Part II K 2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part II K 2 shall be submitted to the Department prior to or together with any reports, or information to be signed by an authorized representative.
4. Certification. Any person signing a document under Parts II K 1 or 2 shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. Duty to Comply.

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the State Water Control Law and the Clean Water Act, except that noncompliance with certain provisions of this permit may constitute a violation of the State Water Control Law but not the Clean Water Act. Permit noncompliance is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if this permit has not yet been modified to incorporate the requirement.

M. Duty to Reapply.

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. All permittees with a currently effective permit shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Board. The Board shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

N. Effect of a Permit.

This permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state or local law or regulations.

O. State Law.

Nothing in this permit shall be construed to preclude the institution of any legal action under, or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by Section 510 of the Clean Water Act. Except as provided in permit conditions on "bypassing" (Part II U), and "upset" (Part II V) nothing in this permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

P. Oil and Hazardous Substance Liability.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Sections 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

Q. Proper Operation and Maintenance.

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

R. Disposal of solids or sludges.

Solids, sludges or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering state waters.

S. Duty to Mitigate.

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

T. Need to Halt or Reduce Activity not a Defense.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

U. Bypass.

1. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II U 2 and U 3.
2. Notice
 - a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, prior notice shall be submitted, if possible at least ten days before the date of the bypass.
 - b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Part II I.
3. Prohibition of bypass.
 - a. Bypass is prohibited, and the Board may take enforcement action against a permittee for bypass, unless:
 - (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - (3) The permittee submitted notices as required under Part II U 2.
 - b. The Board may approve an anticipated bypass, after considering its adverse effects, if the Board determines that it will meet the three conditions listed above in Part II U 3 a.

V. Upset.

1. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of Part II V 2 are met. A determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is not a final administrative action subject to judicial review.
2. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - b. The permitted facility was at the time being properly operated;

- c. The permittee submitted notice of the upset as required in Part II I; and
 - d. The permittee complied with any remedial measures required under Part II S.
3. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

W. Inspection and Entry.

The permittee shall allow the Director, or an authorized representative, upon presentation of credentials and other documents as may be required by law, to:

- 1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- 4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act and the State Water Control Law, any substances or parameters at any location.

For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours, and whenever the facility is discharging. Nothing contained herein shall make an inspection unreasonable during an emergency.

X. Permit Actions.

Permits may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Y. Transfer of permits.

- 1. Permits are not transferable to any person except after notice to the Department. Except as provided in Part II Y 2, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued, or a minor modification made, to identify the new permittee and incorporate such other requirements as may be necessary under the State Water Control Law and the Clean Water Act.
- 2. As an alternative to transfers under Part II Y 1, this permit may be automatically transferred to a new permittee if:
 - a. The current permittee notifies the Department at least 30 days in advance of the proposed transfer of the title to the facility or property;
 - b. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and
 - c. The Board does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Part II Y 2 b.

Z. Severability.

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

OMEGA Protein

Permit #: VA0003867

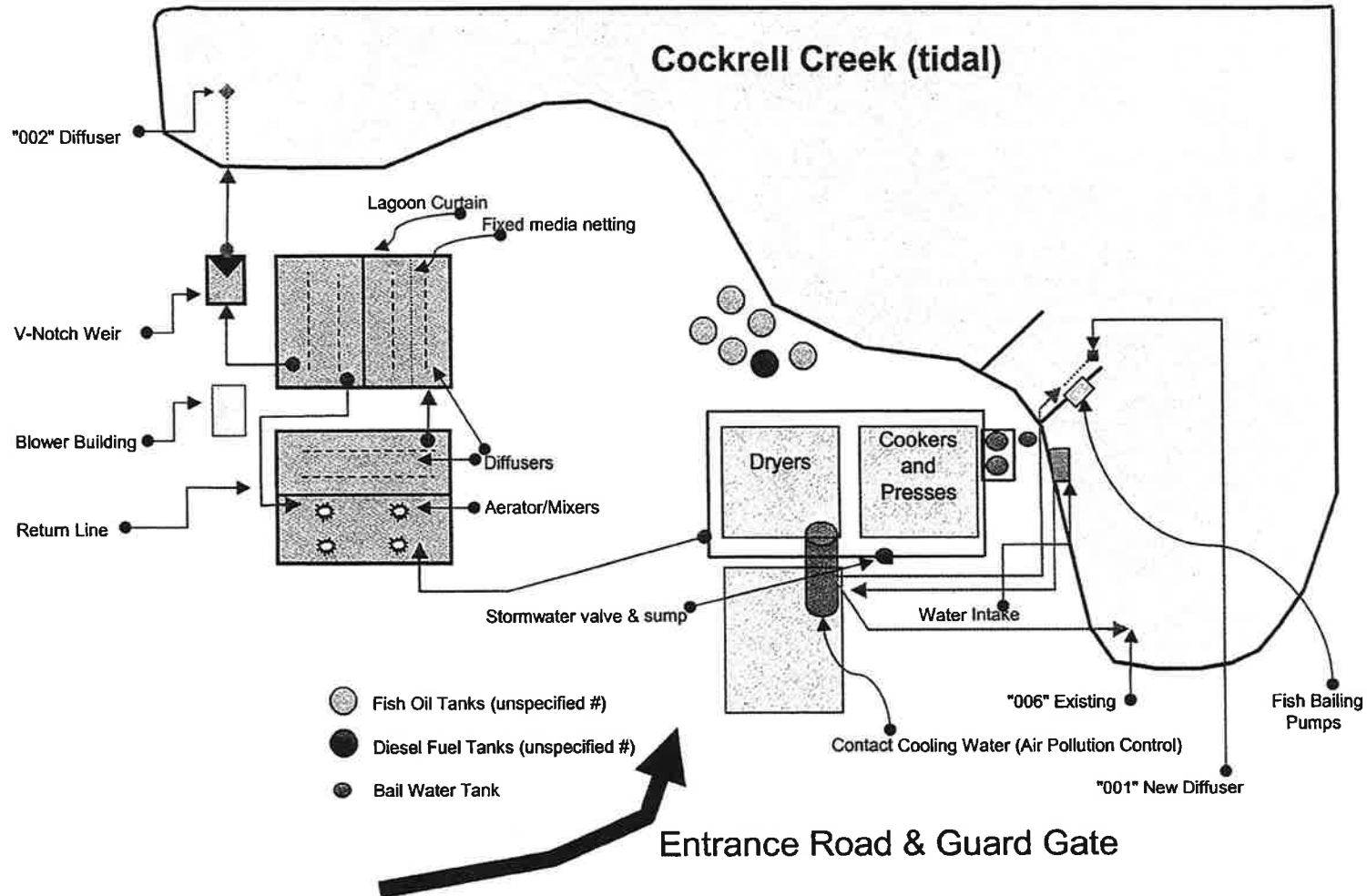
Insp. Date: October 9, 2002

Inspector: Steven G. Stell

Not to scale



Approx. NORTH



Omega Protein, Inc.

PART I
CONTACT COOLING WATER

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 001.

Such discharges shall be limited and monitored at outfall 001 by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE	MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
Flow (MGD)	NL		NA	NA	NL		Cont.	Estimate
BOD ₅ ³	1700 Kg/d		NA	NA	3100 Kg/d		3/Week	24-HC
Total Suspended Solids ³ (TSS)	650 Kg/d		NA	NA	1600 Kg/d		3/Week	24-HC
Oil & Grease ³	370 Kg/d		NA	NA	680 Kg/d		3/Week	Grab
pH (Standard Units)	NA		NA	6.0	9.0		3/Week	Grab
Total Phosphorus ³	23 Kg/d	2.0 Mg/l	NA	NA	NL Kg/d	NL Mg/l	2/Month	24-HC
Total Nitrogen ³	NL Kg/d	NL Mg/l	NA	NA	NL Kg/d	NL Mg/l	2/Month	24-HC
Ammonia-Nitrogen ³	NL Mg/l		NA	NA	NL Mg/l		2/Month	24-HC
Cyanide ³	96 ug/l		NA	NA	110 ug/l		2/Month	Grab
Dissolved Silver ² ug/l	NL		NA	NA	NL		2/Month	Grab
Chlorine Produced Oxidant ^{3,4}	580 ug/l		NA	NA	1200 ug/l		1/Day	Grab
Temperature (degrees C)	NA		NA	NA	50		1/Day	Immersion Stabilization

NL = No Limitation, monitoring only

NA = Not Applicable

2. There shall be no discharge of floating solids or visible foam in other than trace amounts.
3. See Part I.B.1 for compliance requirements.

Omega Protein, Inc.

PART I

AERATED LAGOONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 002.

Such discharges shall be limited and monitored at outfall 002 by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	NL	NA	NA	NL	Cont.	Measured
Temperature (°C)	NL	NA	NA	NL	2/Week	Immersion Stabilization
BOD ₅ ⁷ (Kg/d)	470 Kg/d	NA	NA	840 Kg/d	2/Month	24-HC
Total Suspended Solids ⁷ (Kg/d)	160 Kg/d	NA	NA	410 Kg/d	2/Month	24-HC
Oil and Grease ⁷	25 Kg/d	NA	NA	46 Kg/d	2/Month	Grab
Ammonia ⁷	38 Mg/l	NA	NA	45 Mg/l	2/Month	24-HC
Toxicity, Whole Effluent (WET) (TU ₉₆) ¹⁴	NA	NA	NA	acute toxic units	1/3 Months	24-HC
Total Nitrogen mg/l	NL	NA	NA	NL	2/Month	24-HC
Total Phosphorus mg/l ^{7,8}	NL	NA	NA	NL	2/Month	24-HC
Fecal Coliform N/100 ml ^{7,8}	200 Geometric mean	NA	NA	NA	1/Week between 10 A.M. and 4 P.M.	Grab
enterococci N/100 ml ^{7,8}	35 Geometric mean	NA	NA	NA	1/Week between 10 A.M. and 4 P.M.	Grab
pH (Standard Units)	NA	NA	6.0	9.0	2/Week	Grab

NL = No Limitation, monitoring only

NA = Not Applicable

6. There shall be no discharge of floating solids or visible foam in other than trace amounts.
7. Part I.B.1 for compliance requirements.
8. Schedule of Compliance applies for enterococci and Fecal Coliform: Also see Part I.B.17 and I.B.5.
9. Whole Effluent Toxicity Effluent Limitation and Monitoring Requirements (Acute WET Limit)
 - a. Commencing with the effective date of this permit, the permittee shall conduct quarterly acute toxicity tests using 24 hour flow-proportioned composite samples of final effluent from outfall 002. The quarters shall be defined by the seasonal operation of the facility: First Quarter: May-July; Second Quarter: August-October; Third Quarter: November-January; Fourth Quarter: February-April. The acute toxicity tests shall be 48-hour static tests using Mysidopsis bahia. The TU_a shall be reported on the DMR for the month following the quarter in which the test is performed. Express the result as TU_a (Acute Toxic Units) by dividing $100/LC_{50}$. Two copies of a detailed report concerning the conduct of the test shall accompany the results. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality, if requested by the permittee. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.
 - b. In the event that quarterly WET testing as in a. above is not possible due to lack of operations at the facility, the permittee shall submit a written notice to the Department of Environmental Quality with the DMR submitted for the month following the quarter in which the test was to have been performed.
 - c. This permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.

PART I

EVAPORATOR CONDENSATE

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

10. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 003.

Such discharges shall be limited and monitored at outfall 003 by the permittee as specified below and in Special Condition Part I.B.2 (Page 8 of 20):

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	NL	NA	NA	NL	Cont.	Est.
BOD ₅ ¹²	4300 Kg/d	NA	NA	7700 Kg/d	2/Month	24-HC
Total Suspended Solids ¹² (TSS)	110 Kg/d	NA	NA	280 Kg/d	2/Month	24-HC
Oil & Grease ¹²	430 Kg/d	NA	NA	780 Kg/d	2/Month	Grab
pH (Standard Units)	NA	NA	6.0	9.0	2/Month	Grab
Ammonia ¹² (mg/l)	38 Mg/l	NA	NA	46 Mg/l	2/Month	24-HC
Dissolved Oxygen (mg/l)	NL	NA	NA	NL	1/Day	Grab
Copper, Dissolved ¹² (ug/l)	NL	NA	NA	NL	2/ Month	Grab
Temperature (°C)	NL	NA	NA	NL	1/Day	Immersion Stabilization

NL = No Limitation, monitoring only

NA = Not Applicable

11. There shall be no discharge of floating solids or visible foam in other than trace amounts.

12. See Part I.B.1 for compliance requirements.

Omega Protein, Inc.

PART I

NON-CONTACT COOLING WATER

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

13. During the period beginning with the permit's effective date and lasting until the permit's expiration date the permittee is authorized to discharge from outfall number 004/ 005.

Such discharges shall be limited and monitored at outfall 004/005 as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE	MINIMUM	MAXIMUM		FRE-QUENCY	SAMPLE TYPE
Flow (MGD)	NL		NA	NA	NL		Cont.	Estimate
Temperature (°C)	NL		NA	NA	45		1/Day	Immersion Stabilization
Total Phosphorus ¹⁸	54 Kg/d	2.0 mg/l	NA	NA	NL Kg/d	NL Mg/l	1/Quarter	24-HC
Total Dissolved Zinc (ug/l) ¹⁶	NL		NA	NA	NL		2/Month	Grab
Total Recoverable Copper (ug/l) ^{15, 18}	10		NA	NA	12		2/Month	Grab
pH (Standard Units)	NA		NA	6.0	9.0		5/Week	Grab

NL = No Limitation, monitoring only

NA = Not Applicable

14. There shall be no discharge of floating solids or visible foam in other than trace amounts.

15. Schedule of Compliance applies for Total Recoverable Copper. Also see Part I.B.17 and I.B.5.

16. See Part I.B.1 for compliance requirements.

TRANSACTION REPORT

Transmission

Transaction(s) completed

NO.	TX DATE/TIME	DESTINATION	DURATION	PGS.	RESULT	MODE
434	MAY. 1 10:56	7138686996	0' 10' 29"	040	OK	N ECM

VIRGINIA DEPARTMENT OF
ENVIRONMENTAL QUALITYKILHARNOCK OFFICE
P. O. BOX 669
KILHARNOCK, VA 22482
(804) 435-3181FAX COVER SHEET

DATE: 5-1-03

TO: Bill Black

FROM: Denise M

SUBJECT: Omega draft

COMMENTS: hard copy + fact sheet to follow by mail
to you + byell -

PUBLIC NOTICE

REISSUANCE OF A VPDES PERMIT TO DISCHARGE TO STATE WATERS AND STATE CERTIFICATION UNDER THE STATE WATER CONTROL LAW

First Public Notice Issue Date: **(To be supplied by the newspaper)**

The State Water Control Board has under consideration the **reissuance** of the following Permit and State Certificate:

Permit Number:	VA0003867
Name of Permittee:	Omega Protein, Inc.
Permittee Address:	P.O. Box 175, Reedville, Va. 22539
Facility Name:	Omega Protein, Inc.
Facility Location:	End of VSH 659, Reedville, Va. 22539

**Discharge
Description:**

Existing Industrial Discharges resulting from the operation of a menhaden fishery. The discharges consist of contact cooling water (001) from the air scrubber, non-contact cooling water (004/005) from the evaporator, the treatment lagoon for the fish condensate (002) and the emergency barge discharge (003) which is retained in the permit in case of emergency but has not been used in over 15 years.

Effluent Flow:	9.29 MGD total
Total number of outfalls:	4
Receiving Stream:	Cockrell's Creek (001, 002, 004/005) Chesapeake Bay (003)
Cockrell's Creek River Mile:	1.00
Chesapeake Bay location:	a quadrant specified by the following four points, designated by latitude 37° 30' 0", longitude 76° 12' 40"; latitude 37° 45' 55", longitude 76° 13' 15"; latitude 37° 53' 12", longitude 76° 4' 20"; latitude 37° 30' 0", longitude 76° 2' 35"
Basin:	Chesapeake Bay/ Atlantic/Sm. Coastal
Subbasin:	NA
Section:	2
Class:	II
Special Standards:	a, NEW-20

This proposed reissuance is tentative. On the basis of preliminary review and application of lawful standards and regulations, the State Water Control Board proposes to **reissue** the permit subject to certain conditions. This permit will maintain the Water Quality Standards adopted by the Board. The proposed reissuance consists of limiting the following parameters in each discharge: 001: Flow Monitoring only;

Biochemical Oxygen Demand 1700 kg/d monthly average/3100 kg/d maximum; Total Suspended Solids 650 kg/d monthly average/1600 maximum; Oil and Grease 370 kg/d/680 kg/d maximum; pH between 6.0 and 9.0 standard units; Total Phosphorus 2.0 mg/l, Total Nitrogen monitoring only; Ammonia-Nitrogen monitoring only; Cyanide 96 ug/l monthly average/ 110 ug/l maximum; Dissolved Silver monitoring only; chlorine produced oxidant 580 ug/l monthly average/1200 ug/l maximum (effective upon submittal of a plan and schedule); enterococci 35/100 ml geometric mean (effective according to a compliance schedule) and Temperature 50 degrees C maximum. 002: Flow Monitoring only; Biochemical Oxygen Demand 270 kg/d monthly average/480 kg/d maximum; Total Suspended Solids 160 kg/d monthly average/410 kg/d maximum; Oil and Grease 25 kg/d monthly average/46 kg/d maximum; pH between 6.0 and 9.0 standard units; Ammonia-Nitrogen 38 mg/l monthly average/45 mg/l maximum; enterococci 35/100 ml geometric mean (effective according to a compliance schedule), Whole Effluent Toxicity 14 Acute toxic units and Temperature monitoring only. 003: Flow Monitoring only; Biochemical Oxygen Demand 4300 kg/d monthly average/7700 kg/d maximum; Total Suspended Solids 110 kg/d monthly average/280 maximum; Oil and Grease 430 kg/d/780 kg/d maximum; pH between 6.0 and 9.0 standard units; Dissolved Oxygen monitoring only, Dissolved Copper monitoring only; Ammonia-Nitrogen 36 mg/l monthly average/44 mg/l maximum, Temperature monitoring only. 004/005: Flow monitoring only; pH between 6.0 and 9.0 standard units; Total Phosphorus 2.0 mg/l, Total Nitrogen monitoring only; Ammonia-Nitrogen monitoring only; Total Recoverable Copper 10 ug/l monthly average/12 ug/l maximum (effective according to a compliance schedule); enterococci 35/100 ml geometric mean (effective according to a compliance schedule), Temperature 45 degrees C maximum.

All pertinent information is on file and may be inspected, or copied by contacting **Denise M. Mosca** at:

Virginia Department of Environmental Quality
Kilmarnock Field Office
P.O. Box 669
Kilmarnock, Va. 22482

Telephone No.: (804) 435-3181
email address: dmmosca@deq.state.va.us

Persons may comment in writing or by email to the Department of Environmental Quality (DEQ) on the proposed **reissuance** of the permit and may request a public hearing within 30 days from the date of the first notice. Address comments to the contact person listed above. Comments shall include the name, address, and telephone number of the writer and shall contain a complete, concise statement of the factual basis for the comments. Only those comments received within this period will

(Public Notice, page 3)
(Permit No. VA0003867)

be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action.

Following the comment period, the Board will make a determination regarding the proposed **reissuance**. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

Permit No. VA0003867

Effective Date:

Expiration Date:

AUTHORIZATION TO DISCHARGE UNDER THE
VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM
AND
THE VIRGINIA STATE WATER CONTROL LAW

In compliance with the provisions of the Clean Water Act as amended and pursuant to the State Water Control Law and regulations adopted pursuant thereto, the following owner is authorized to discharge in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in this permit.

OWNER:	Omega Protein, Inc.
FACILITY NAME:	Omega Protein, Inc.
CITY:	Reedville
COUNTY:	Northumberland
FACILITY LOCATION:	End of VSH 659, Reedville, Va. 22539

The owner is authorized to discharge to the following receiving stream:

STREAM:	Cockrell Creek and Chesapeake Bay
RIVER BASIN:	Ches Bay/Atl/Sm Coastal
RIVER SUBBASIN:	N/A
SECTION:	2
CLASS:	II
SPECIAL STANDARDS:	a, NEW-20

The authorized discharge shall be in accordance with this cover page, Part I - Effluent Limitations and Monitoring Requirements and Part II - Conditions Applicable to All VPDES Permits, as set forth herein.

Director, Department of Environmental Quality

Date

Omega Protein, Inc.

PART I
CONTACT COOLING WATER

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

- During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 001.

Such discharges shall be limited and monitored at outfall 001 by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE	MINIMUM	MAXIMUM		FREQUENCY	SAMPLE TYPE
Flow (MGD)	NL		NA	NA	NL		Cont.	Estimate
BOD ₅ ³	1700 Kg/d		NA	NA	3100 Kg/d		3/Week	24-HC
Total Suspended Solids ³ (TSS)	650 Kg/d		NA	NA	1600 Kg/d		3/Week	24-HC
Oil & Grease ³	370 Kg/d		NA	NA	680 Kg/d		3/Week	Grab
pH (Standard Units)	NA		NA	6.0	9.0		3/Week	Grab
Total Phosphorus ³	23 Kg/d	2.0 Mg/l	NA	NA	NL	NL	2/Month	24-HC
Total Nitrogen ³	NL Kg/d	NL Mg/l	NA	NA	NL Kg/d	NL Mg/l	2/Month	24-HC
Ammonia-Nitrogen ³	NL Mg/l		NA	NA	NL Mg/l		2/Month	24-HC
Cyanide ³	96 ug/l		NA	NA	110 ug/l		2/Month	Grab
Dissolved Silver ³ ug/l	NL		NA	NA	NL		2/Month	Grab
Chlorine Produced Oxidant ^{3,4}	580 ug/l		NA	NA	1200 ug/l		1/Day	Grab
enterococci N/100 ml ^{3,5}	35 Geometric Mean		NA	NA	NA		1/Day between 10 A.M. and 4 P.M.	Grab
Temperature (degrees C)	NA		NA	NA	50		1/Day	Immersion Stabilization

NL = No Limitation, monitoring only

NA = Not Applicable

2. There shall be no discharge of floating solids or visible foam in other than trace amounts.
3. See Part I.B.1 for compliance requirements.
4. This limit will become effective upon the submittal and DEQ approval of a plan and schedule for the addition of chlorine associated with cyanide removal process. See Special Condition Part I.B.13.
5. Schedule of Compliance applies for enterococci: Also see Part I.B.17 and I.B.5.

Omega Protein, Inc.

PART I

AERATED LAGOONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 002.

Such discharges shall be limited and monitored at outfall 002 by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	NL	NA	NA	NL	Cont.	Measured
Temperature (°C)	NL	NA	NA	NL	1/Day	Immersion Stabilization
BOD ₅ ⁸ (Kg/d)	270 Kg/d	NA	NA	480 Kg/d	2/Month	24-HC
Total Suspended Solids ⁸ (Kg/d)	160 Kg/d	NA	NA	410 Kg/d	2/Month	24-HC
Oil and Grease ⁸	25 Kg/d	NA	NA	46 Kg/d	2/Month	Grab
Ammonia ⁸	38 Mg/l	NA	NA	45 Mg/l	2/Month	24-HC
Toxicity, Whole Effluent (WET) (TU _a) ¹⁶	NA	NA	14 acute toxic units	14 acute toxic units	1/3 Months	24-HC
enterococci N/100 ml ^{8,9}	35 Geometric mean	NA	NA	NA	3 Days/Week between 10 A.M. and 4 P.M.	Grab
pH (Standard Units)	NA	NA	6.0	9.0	2/Week	Grab

NL = No Limitation, monitoring only

NA = Not Applicable

7. There shall be no discharge of floating solids or visible foam in other than trace amounts.
8. Part I.B.1 for compliance requirements.
9. Schedule of Compliance applies for enterococci: Also see Part I.B.17 and I.B.5.

10. Whole Effluent Toxicity Effluent Limitation and Monitoring Requirements (Acute WET Limit)

- a. **Commencing with the effective date of this permit, the permittee shall conduct quarterly acute toxicity tests using 24 hour flow-proportioned composite samples of final effluent from outfall 002.** The quarters shall be defined by the seasonal operation of the facility: First Quarter: May-July; Second Quarter: August-October; Third Quarter: November-January; Fourth Quarter: February-April. The acute toxicity tests shall be 48-hour static tests using Mysidopsis bahia. **The LC₅₀ or TU_a shall be reported on the DMR for the month following the quarter in which the test is performed. Two copies of a detailed report concerning the conduct of the test shall accompany the results.** Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality, if requested by the permittee. **Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.**
- b. In the event that quarterly WET testing as in a. above is not possible due to lack of operations at the facility, the permittee shall submit a written notice to the Department of Environmental Quality with the DMR submitted for the month following the quarter in which the test was to have been performed.
- c. This permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters. The pollutant specific limits must control the toxicity of the effluent.

PART I
EVAPORATOR CONDENSATE

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

11. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to discharge from outfall number 003.

Such discharges shall be limited and monitored at outfall 003 by the permittee as specified below and in Special Condition Part I.B.2 (Page 7 of 29):

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE	WEEKLY AVERAGE	MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD)	NL	NA	NA	NL	Cont.	Est.
BOD ₅ ¹³	4300 Kg/d	NA	NA	7700 Kg/d	2/Month	24-HC
Total Suspended Solids ¹³ (TSS)	110 Kg/d	NA	NA	280 Kg/d	2/Month	24-HC
Oil & Grease ¹³	430 Kg/d	NA	NA	780 Kg/d	2/Month	Grab
pH (Standard Units)	NA	NA	6.0	9.0	2/Month	Grab
Ammonia ¹³ (mg/l)	36 Mg/l	NA	NA	44 Mg/l	2/Month	24-HC
Dissolved Oxygen (mg/l)	NL	NA	NL	NA	1/Day	Grab
Copper, Dissolved ¹³ (ug/l)	NL	NA	NL	NA	2/ Month	Grab
Temperature (°C)	NL	NA	NA	NL	1/Day	Immersion Stabilization

NL = No Limitation, monitoring only
NA = Not Applicable

12. There shall be no discharge of floating solids or visible foam in other than trace amounts.

13. See Part I.B.1 for compliance requirements.

Omega Protein, Inc.

PART I

NON-CONTACT COOLING WATER

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

14. During the period beginning with the permit's effective date and lasting until the permit's expiration date the permittee is authorized to discharge from outfall number 004/ 005.

Such discharges shall be limited and monitored at outfall 004/005 as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	MONTHLY AVERAGE		WEEKLY AVERAGE	MINIMUM	MAXIMUM		FRE-QUENCY	SAMPLE TYPE
Flow (MGD)	NL		NA	NA	NL		Cont.	Estimate
Temperature (°C)	NL		NA	NA	45		1/Day	Immersion Stabilization
Total Phosphorus ¹⁷	54 Kg/d	2.0 mg/l	NA	NA	NL Kg/d	NL Mg/l	1/Quarter	24-HC
Total Nitrogen ¹⁷	NL Kg/d	NL Mg/l	NA	NA	NL Kg/d	NL Mg/l	1/Quarter	24-HC
Ammonia-Nitrogen ¹⁷ (Mg/l)	NL		NA	NA	NL		2/Month	24-HC
Total Recoverable Copper (ug/l) ^{16, 17}	10		NA	NA	12		2/Month	Grab
enterococci ^{16, 17} N/100 ml	35 Geometric Mean		NA	NA	NA		1/Day between 10 A.M. and 4 P.M.	Grab
pH (Standard Units)	NA		NA	6.0	9.0		5/Week	Grab

NL = No Limitation, monitoring only

NA = Not Applicable

15. There shall be no discharge of floating solids or visible foam in other than trace amounts.

16. Schedule of Compliance applies for Total Recoverable Copper and enterococci: Also see Part I.B.17 and I.B.5.

17. See Part I.B.1 for compliance requirements.

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

1. Compliance Reporting under Part I.A. and Part I.B.

a. The quantification levels (QL) shall be as follows:

<u>Effluent Characteristic</u>	<u>Quantification Level</u>
BOD ₅	5 mg/l
TSS	1 mg/l
Chlorine	0.1 mg/l
Ammonia-N	0.2 mg/l
Cyanide	0.01 mg/l
Oil and Grease	5 mg/l
Total Phosphorus	0.1 mg/l
Total Nitrogen	0.54 mg/l
Enterococci	2/100 ml
Total Recoverable Copper/ Dissolved Copper	4.8 ug/l
Dissolved Silver	1.8 ug/l

b. Reporting

- (1) Monthly Average Limit--Compliance with the monthly average limitations and/or reporting requirements for the parameters listed in Part I.A and B. shall be determined as follows: All concentration data below the QL listed above shall be treated as zero. All concentration data equal to or above the QL listed in above shall be treated as it is reported. An arithmetic average shall be calculated using all reported data, including the defined zeros, for the month. This arithmetic average shall be reported on the DMR as calculated. If all data are below the QL, then the average shall be reported as "<QL." If reporting for quantity is required on the DMR and the calculated concentration is <QL then report "<QL" for the quantity otherwise use the calculated concentration.
 - (2) Daily Maximum Limit--Compliance with the daily maximum limitations and/or reporting requirements for the parameters listed in Part I.A. and B. shall be determined as follows: All concentration data below the QL listed in 1. above shall be treated as zero. All concentration data equal to or above the QL shall be treated as reported. An arithmetic average of the values shall be calculated using all reported data, including the defined zeroes, collected for each day during the reporting month. The maximum value of these daily averages thus determined shall be reported on the DMR as the Daily Maximum. If all data are below the QL then the average shall be reported as "<QL." If reporting for quantity is required on the DMR and the calculated concentration is <QL then report "<QL" for the quantity otherwise use the calculated concentration.
 - (3) Any single datum required shall be reported as "<QL" if it is less than the QL listed in 1.above. Otherwise the numerical value shall be reported.
2. The discharge from Outfall 003 will be transported to the Chesapeake Bay and shall meet the following requirements:
- a. pH limitation for this outfall shall be met through analysis of samples taken at barge effluent in

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

accordance with "b" described below.

- b. The discharge into the Chesapeake Bay will be allowed only into a quadrant specified by the following four points, designated by latitude 37° 30' 0", longitude 76° 12' 40"; latitude 37° 45' 55", longitude 76° 13' 15"; latitude 37° 53' 12", longitude 76° 4' 20"; latitude 37° 30' 0", longitude 76° 2' 35"; as shown on Attachment A.
- c. A Bay discharge vessel log must be maintained and made available to the Department of Environmental Quality for inspection upon request by the staff.
- d. While discharging in the designated area, the barge discharge shall be accomplished according to the following restrictions:

Pump Rate	Barge Speed
1000 gpm	>2 knots
1500 gpm	>3 knots
2000 gpm	>4 knots.

The pump rate and barge speed shall be recorded in the discharge vessel log for each discharge.

- e. Monitoring of the designated area of the Chesapeake Bay (B.2.b.) for BOD₅, Ammonia, pH, Temperature, Dissolved Oxygen and Salinity, is required before and after each discharge, and the samples shall be grabbed at a depth of between six to eight feet below the surface of the water inside the visible discharge plume. These data shall be submitted with the DMR for that month to be received at the DEQ-Kilmarnock Office by the tenth of the following month.
3. The discharge of refrigeration water will be transported to the Chesapeake Bay and shall meet the following requirements:
- a. The pH of the effluent shall be between 6 and 9 S.U.
 - b. The discharge from the permittee's vessels into the Chesapeake Bay will be allowed only east of a line between Fletton Point Light and Black Can Buoy # 3. Such discharge shall be made while the vessel is underway and at such a rate that it is not visible.
 - c. A Bay discharge vessel log must be maintained and made available to the Department of Environmental Quality for inspection upon request by the staff.
 - d. Monitoring of the designated area of the Chesapeake Bay (B.2.b.) for BOD₅, Ammonia, pH, Temperature, Dissolved Oxygen and Salinity, is required twice a month before and after the discharge, and the samples shall be grabbed at a depth of between six to eight feet below the surface of the water inside the visible discharge plume. These data shall be submitted with the DMR for that month to be received at the DEQ-Kilmarnock Office by the tenth of the following month. Any discharge of refrigeration water to State waters must result in compliance with Water Quality Standards.
4. The permittee shall submit a plan for monitoring of Cockrell's Creek which shall include the following components, at a minimum:

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

- a. Sampling/monitoring station locations, including a map with the locations noted.
- b. The permittee shall sample weekly for the parameters of ammonia-nitrogen, temperature, pH, and salinity in accordance with procedures approved under Title 40 Code of Federal Regulations Part 136 or alternative methods approved by the U.S. Environmental Protection Agency. Please refer to B.1. above for quantification levels. At the time of sampling, the permittee shall ensure that the effects of tidal influences are kept to an absolute minimum by sampling at low slack water tide.
- c. Sampling shall begin within 30 days of the reissuance of this permit and each subsequent year with the start of fishing for that particular year. Sample results shall be submitted to the Piedmont Regional Office of the DEQ by the 10th day of the following month.
- d. If the results of this monitoring indicate actual or potential water quality standard violations, the permit may be modified, or, alternatively, revoked and reissued, in order to incorporate more stringent permit requirements.

5. BACTERIAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS –
ADDITIONAL INSTRUCTIONS

- e. Enterococci sampling and analysis shall be performed in accordance with one of the following methods:
 - 1). EPA Method 1600: Membrane Filtration Method for Enterococci in Water
 - 2). Standard Methods (18th, 19th, 20th editions) Method 9230B: Multiple Tube Technique for Fecal Streptococcus and Enterococcus Groups
 - 3). Standard Methods (18th, 19th, 20th editions) Method 9230C: Membrane Filter Techniques for Fecal Streptococcus and Enterococcus Groups
 - 4). ASTM Method D6503 (ASTM Volume 11.02): Standard Test Method of Enterococci in Water Using Enteroleit^(TM)
6. The permittee shall notify the Department as soon as they know or have reason to believe:
 - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 ug/l);
 - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2, 4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application; or
 - (4) The level established by the Board.
 - b. That any activity has occurred or will occur which would result in any discharge on a non-routine or infrequent basis of a toxic pollutant which is not limited in the permit if that discharge will exceed the highest of the following "notification levels":
 - (1) Five hundred micrograms per liter (500 ug/l);
 - (2) One milligram per liter (1 mg/l) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application; or



B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

(4) The level established by the Board.

7. Any and all product, materials, industrial wastes, and/or other wastes resulting from the purchase, sale, mining, extraction, transport, preparation and/or storage of raw or intermediate materials, final product, by-product or wastes, shall be handled, disposed of, and/or stored in such a manner so as not to permit a discharge of such a product, materials, industrial wastes, and/or other wastes to State waters, except as expressly authorized.
8. This permit shall be modified or alternatively revoked and reissued to include new or alternative nutrient limitations and/or monitoring requirements should the Board adopt nutrient standards for the Chesapeake Bay and tributary river basins, or if a future water quality regulation, statute, or water quality management plan requires new or alternative nutrient control.

9. Operations and Maintenance Manual

The permittee shall maintain an accurate, approved operation and maintenance manual for the treatment works. This manual shall detail the practices and procedures which will be followed to ensure compliance with the requirements of this permit. The permittee shall operate the treatment works in accordance with the approved O&M manual. This manual shall include, but not necessarily be limited to, the following items, as appropriate:

- a. Techniques to be employed in the collection, preservation and analysis of effluent samples;
- b. Discussion of Best Management Practices, if applicable;
- c. Procedures for handling, storing, and disposing of all wastes, fluids, and pollutants characterized in Part I.B.7 that will prevent these materials from reaching state waters.
- d. Treatment works design, treatment works operation, routine preventive maintenance of units within the treatment system, critical spare parts inventory and record keeping; and
- e. A Sludge/Solids disposal plan.

Any changes in the practices and procedures followed by the permittee shall be documented and submitted to the Department of Environmental Quality, Piedmont Office, for staff approval within 90 days of the effective date of the changes. Upon approval of the submitted manual changes, the revised manual becomes an enforceable part of the permit.

10. The permittee shall employ or contract at least one Class III licensed wastewater works operator for the facility. The license shall be issued in accordance with Title 54.1 of the Code of Virginia and the regulations of the Board for Waterworks and Wastewater Works Operators. The permittee shall notify the Department in writing whenever he is not complying, or has grounds for anticipating he will not comply with this requirement. The notification shall include a statement of reasons and a prompt schedule for achieving compliance.
11. The permittee shall complete and submit Item V and VI of Form 2C, for Outfall 003, no later than 30 days after the first discharge at the outfall. Following an evaluation of the required information, this permit may be modified or alternatively, revoked and reissued in order to incorporate additional or different permit conditions.
12. The permittee shall submit to the DEQ Piedmont Regional Office a lagoon salinity profile

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

within 90 days of the reissuance of this permit. Following an evaluation of the required information, this permit may be modified or alternatively, revoked and reissued in order to incorporate additional or different permit conditions.

13. The permittee shall **submit plans and specifications for the use of chlorine in the cyanide removal process by June 26, 2003.** Upon written approval by DEQ, the chlorine limit at 001 shall become effective.

14. Best Management Practices (BMP)

- a. The permittee shall comply with the following at the Off Season Maintenance area shown in Attachment B:

1. Best Management Practices (BMP)

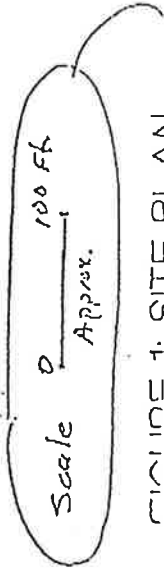
- a) The permittee shall comply with the following:

- (1) For vessels in which sanitary waste tanks (holding tanks) are installed, all sewage from the vessels shall be removed and disposed of by a commercial waste disposal company or discharged into the shipyard's sanitary waste system.
- (2) For vessels without sanitary waste holding tanks installed, the vessel's sanitary systems shall not be permitted to discharge sewage overboard into the adjacent river. Vessels without holding tanks shall be connected to a holding tank or shoreside system in compliance with Virginia Department of Health Regulations.
- (3) The yard shall be cleaned on a regular basis to minimize the possibility that runoff will carry spent abrasives, paints, solvents, cleaners, anti-corrosive compounds, paint chips, scrap metal, trash, garbage, petroleum products or other debris into the receiving stream. Cleanup of areas contributing runoff shall consist of mechanical or manual methods to sweep up and collect the debris.

Mechanical cleanup may be accomplished by mechanical sweepers, front end loaders, vacuum cleaners or other innovative equipment. Manual methods include the use of shovels and brooms.

- (4) Docks shall also be cleaned on a regular basis so as to prevent rain from washing material into receiving waters.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	5
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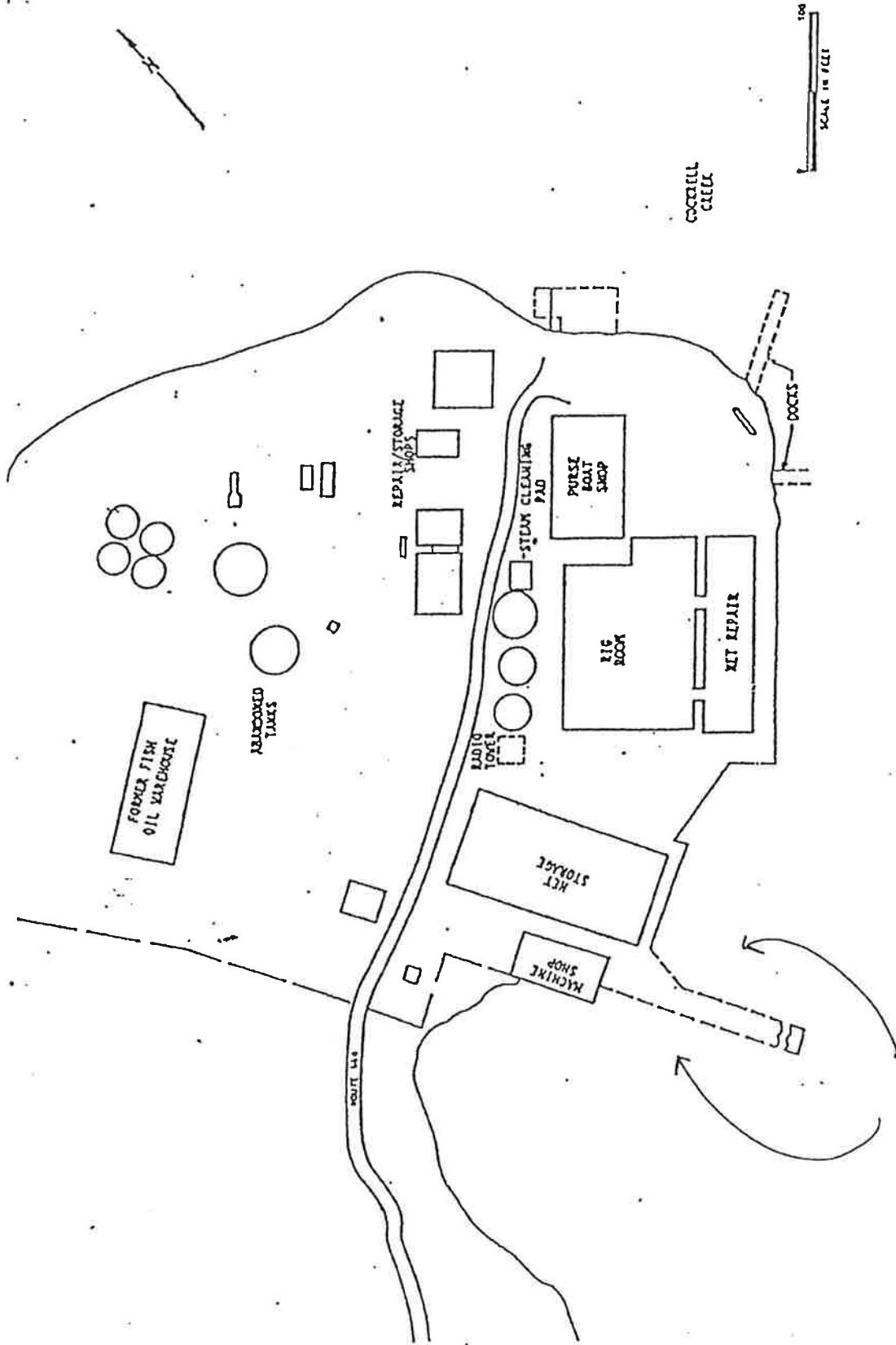
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Fairport-Boatyard

Omega Protein, Inc.
Reedville, VA February



Ship Repair (BMPs)

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

- (5) Acceptable methods of control shall be utilized during abrasive blasting and spray painting, with the intent of preventing blast dust and overspray from falling into the receiving water. These include the following: downspraying of blast materials and paint; barriers or shrouds beneath the hull; barriers or shrouds between the hull and temporary/permanent support structures, from the flying bridge to temporary/permanent support structures, or from the bow and stern of the vessel to temporary structures erected for that purpose. The bottom edge of free hanging barriers shall be weighted to hold them in place during a light breeze. When abrasive blasting vessel superstructures, openings and open areas between decks shall be covered (including but not limited to scuppers, railings, freeing ports, ladders, and doorways) if they allow discharge to State waters.
- (6) Fixed or floating platforms shall be used as work surfaces when working at the water surface. These platforms shall be used to provide a surface to catch spent abrasive, slag, paint, trash and other debris/pollutants and shall be cleaned at the end of each work shift.
- (7) Dust and overspray from abrasive blasting and painting in yard facilities shall be controlled to minimize the spreading of wind blown materials. Frequent cleanup of these areas shall be practiced to prevent abrasive blasting waste from being washed into storm sewers or the adjacent waterway.
- (8) When water blasting, hydroblasting, or water-cone blasting is used to remove paint from surfaces, the resulting water and debris shall be collected in a sump or other suitable device. This mixture then will be either delivered to appropriate containers for removal and disposal or subjected to treatment to concentrate the solids for proper disposal and prepare the water for reuse or discharge through an authorized outfall.
- (9) All shipboard cooling water and process water shall be directed away from contact with spent abrasive, paint and other debris. Contact of spent abrasive and paint with water will be prevented by proper segregation and control of wastewater streams.
- (10) Cleaning procedures shall be employed to remove waste materials in order to prevent their introduction into the storm drainage system.
- (11) The sediment traps in the stormwater drainage system(s) for areas around marine railways, docks and other industrial areas shall be inspected on a monthly basis and cleaned as necessary to ensure the interception and retention of solids entering the drainage system. Inspection logs and cleaning records must be maintained.

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

- (12) During the period at the dock, oil, grease or fuel spills shall be prevented from reaching State waters. Cleanup shall be carried out promptly after an oil, grease or fuel spill is detected. Oil containment booms shall be conveniently stored so as to be immediately deployable in the event of a spill.
- (13) Drip pans or other protective devices shall be required for all oil or oily waste transfer operations to catch incidental spillage and drips from hose nozzles, hose racks, drums or barrels.
- (14) Oil contaminated materials shall be removed from the marine repair area as soon as possible.
- (15) If required, an SPCC Plan and an oil spill discharge contingency plan must be on file, maintained current and utilized in the event that an oil spill occurs. If a spill is discovered, designated shipyard personnel should be notified immediately. Such personnel must be familiar with containment and cleanup procedures, and must notify the Coast Guard and the DEQ of all spills that reach State waters, and immediately initiate containment/cleanup efforts. These cleanup procedures apply to hazardous substances kept on site as well. A list of such materials shall be provided to the DEQ for reference if a spill occurs. Included with this list must be an appropriate designated disposal site for each substance. Emulsifiers and dispersants are not suitable cleanup agents for spills in State waters.
- (16) Solid chemicals, chemical solutions, paints, oils, solvents, acids, caustic solutions and waste materials, including used batteries, shall be stored in a manner which will prevent the entry of these materials into waters of the State, including ground waters. Storage shall be in a manner that will prevent entry into State waters by overfilling, tipping, rupture, or other accidents within the storage area.
- (17) All metal finishing chemical solution, caustic wash, and rinse-water tanks shall be stored in such a manner so as to prevent introduction of spills into State waters. Any intercepted chemical spill shall be recycled back to the appropriate chemical solution tank or disposed of. The spilled material must be handled, recycled or disposed of in such a manner as to prevent its discharge into State waters.
- (18) The mixing of paints and solvents shall be carried out in locations and under conditions such that no spill shall enter State waters
- (19) Drip pans or other protective devices shall be required for all paint mixing and solvent transfer operations, unless the mixing operation is carried out in controlled areas away from storm drains, surface waters, shorelines and piers. Drip pans, drop cloths or tarpaulins shall be used whenever paints and solvents are mixed. Sorbents must be on hand to soak up

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

liquid spills. Paints and solvents shall not be mixed in areas where spillage would have direct access to State waters unless containment measures are employed.

- (20) Paint and solvent spills shall be treated as oil spills and shall be prevented from reaching storm drains or deck drains and subsequent discharge into the water.
- (21) The amount of paint stored within the marine repair area shall be kept to a minimum.
- (22) Trash receptacles shall be provided on each pier and onboard each vessel. These receptacles shall be emptied as necessary to prevent trash from entering State waters.
- (23) Leaking connections, valves, pipes, hoses and soil chutes carrying wastewater shall be replaced or repaired immediately. Soil chute and hose connections to vessels and to receiving lines or containers shall be tightly connected and leak free.
- (24) Prior to hose testing, spent abrasives, paint residues, and other debris from the area of the marine repair area shall be removed to prevent pollutants from entering the adjacent river.
- (25) Floatable and low-density waste such as wood and plastic, as well as miscellaneous trash such as paper, insulation, and packaging, etc., shall be removed from the marine repair area.
- (26) Uncontaminated bilge and ballast or oil contaminated bilge and ballast treated by an onboard oil/water separator may be discharged to State waters. Any other contaminated bilge and ballast shall not be discharged except as limited by Part I Effluent Limitations.
- (27) All vessels that are hauled shall be beyond the normal high tidal zone. In the event of vessel overhang during abnormally high tides, all exterior abrasive/water blasting and coating work on the overhanging portion of the vessel shall be discontinued. Exterior work on vessels will not be in areas that extend beyond the length of the marine repair area, unless appropriate precautions are taken to prevent discharge of pollutants into State waters.
- (28) Docking and launching time intervals shall not be considered as a rationale for not cleaning the marine repair area.
- (29) Innovative measures for collecting abrasives may be presented for evaluation.
- (30) Material (spent abrasives, paint chips, etc.) shall be cleaned up from

B. OTHER REQUIREMENTS AND SPECIAL CONDITIONS - (Continued)

the area in the vicinity of the marine repair area before the incoming tide.

- (31) Vessels which have been fitted to collect gray water, either with sewage or separately, shall not discharge the gray water into surface waters unless specifically addressed as a permitted discharge in Part I A.

b.) Reporting

The permittee shall **submit, with the DMRs, a monthly report** certifying compliance or noncompliance with all conditions of the preceding BMPs pertaining to marine repair areas, piers, wet slips and shore side work areas. The reporting form is provided as Attachment C to this permit. The report, as submitted on Attachment C, shall include a weekly audit checklist for these areas and a narrative description of observations. The audit shall be conducted by personnel not routinely associated with the aforementioned activities.

15. The permittee shall **submit to the DEQ Piedmont Regional Office samples of the soil, sediment and water column at both locations of the boat maintenance areas (Attachment B) within 180 days of the reissuance of this permit. The samples shall be tested for Total Petroleum Hydrocarbons, Dissolved Copper, Dissolved Zinc, Dissolved Lead and TBT. A map shall be included showing the location of the samples taken, and must show that the samples were obtained from the area of the docks where the boats are maintained.** Following an evaluation of the required information, this permit may be modified or alternatively, revoked and reissued in order to incorporate additional or different permit conditions.

15. Water Quality Standards Monitoring

The permittee shall monitor the effluent at Outfalls 001, 002, 003, and 004/ 005 for the substances noted in Attachment D of the permit according to the indicated analysis number, quantification level, sample type and frequency. Monitoring shall be initiated after the start of the third year from the permit's effective date. Using Attachment D as the reporting form, the data shall be submitted with the next permit reissuance application, which is due at least 180 days prior to the expiration date of the permit. Monitoring and analysis shall be conducted in accordance with 40 CFR Part 136 or alternative EPA approved methods. It is the responsibility of the permittee to ensure that proper QA/QC protocols are followed during the sample gathering and analytical procedures. The DEQ will use this data for making specific permit decisions in the future. This permit may be modified or alternatively revoked and reissued to incorporate limits for any of the substances listed below.

DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY MONITORING
ATTACHMENT D

FACILITY NAME: Omega Protein
ADDRESS: P.O. Box 125, Reedville, Va. 22539

PERMIT NO.: VA0003867

OUTFALL NO.:

DEQ PAR- AM #	EPA PAR- AM #	CHEMICAL	EPA ANAL- YSIS NO.	QUANTIFI- CATION LEVEL ⁽¹⁾	REPORT- ING RESULTS	SAM- PLE TYPE ⁽²⁾	SAMPLE FRE- QUENCY ⁽³⁾	SPECIFIC TARGET VALUE ⁽⁴⁾ ug/l
METALS								
		Antimony (Dis.)	(5)	(5)		G	1/5 YR	001: 460000 002: 430000 003:12000 0 004/005: 220000
		Arsenic III (Dis.)	(5)	(5)		G	1/5 YR	001: 2300 002: 2200 003:630 004/005: 55
440	01025	Cadmium (Dis.)	(5)	(5)		G	1/5 YR	001: 600 002: 560 003: 160 004/005: 34

DEPARTMENT OF ENVIRONMENTAL QUALITY
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OUTFALL NO.:

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023	01032	Chromium VI (Dis.)	(5)	(5)		G	1/5 YR	001:3200 002: 3000 003:870 004/005: 880
442	01040	Copper (Dis.)	(5)	(5)		G	1/5 YR	001: 240 002: 230 003:66 004/005:4. 7
405	01049	Lead (Dis.)	(5)	(5)		G	1/5 YR	001: 600 002: 560 003: 160 004/005:19 0
444	71890	Mercury (Dis.)	(5)	(5)		G	1/5 YR	001: 1.6 002: 1.5 003: 0.44 004/005: 0.77
445	01065	Nickel (Dis.)	(5)	(5)		G	1/5 YR	001: 530 002: 500 003:140 004/005:60
446	01145	Selenium (Dis.)	(5)	(5)		G	1/5 YR	001: 4600 002: 4300 003: 1200 004/005: 2400
447	01075	Silver (Dis.)	(5)	(5)		G	1/5 YR	001: 980

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OUTFALL NO.:

DEQ PAR- AM #	EPA PAR- AM #	CHEMICAL	EPA ANAL- YSIS NO.	QUANTIFI- CATION LEVEL ⁽¹⁾	REPORT- ING RESULTS	SAM- PLE TYPE ⁽²⁾	SAMPLE FRE- QUENCY ⁽³⁾	SPECIFIC TARGET VALUE ⁽⁴⁾ ug/l
								002: 930 003:270 004/005: 1.8
448	01092	Zinc (Dis.)	(5)	(5)		G	1/5 YR	001: 4100 002: 3800 003:1100 004/005:76
PESTICIDES/PCB'S								
332	39330	Aldrin	608	0.05		G	1/5 YR	NA
333	39350	Chlordane	608	0.2		G	1/5 YR	NA
334	77969	Chlorpyrifos (Dursban)	622	(7)		G	1/5 YR	NA
		DDD	608	0.1		G	1/5 YR	NA
		DDE	608	0.1		G	1/5 YR	NA
335	39370	DDT	608	0.1		G	1/5 YR	NA
336	39560	Demeton	(6)	(7)		G	1/5 YR	NA
337	39380	Dieldrin	608	0.1		G	1/5 YR	NA
		Endosulfan	608	0.1		G	1/5 YR	NA
339	39390	Endrin	608	0.1		G	1/5 YR	NA
340	39580	Guthion	622	(7)		G	1/5 YR	NA
341	39410	Heptachlor	608	0.05		G	1/5 YR	NA
342	77835	Hexachlorocyclo- hexane (Lindane)	608	0.05		G	1/5 YR	NA

DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY MONITORING
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FACILITY NAME: Omega Protein
ADDRESS: P.O. Box 125, Reedville, Va. 22539

PERMIT NO.: VA0003867

OUTFALL NO.:

DEQ PAR- AM #	EPA PAR- AM #	CHEMICAL	EPA ANAL- YSIS NO.	QUANTIFI- CATION LEVEL ⁽¹⁾	REPORT- ING RESULTS	SAM- PLE TYPE ⁽²⁾	SAMPLE FRE- QUENCY ⁽³⁾	SPECIFIC TARGET VALUE ⁽⁴⁾ ug/l
		Kepone	(10)	(7)		G	1/5 YR	NA
343	39530	Malathion	(6)	(7)		G	1/5 YR	NA
344	39480	Methoxychlor	(6)	(7)		G	1/5 YR	NA
345	39755	Mirex	(6)	(7)		G	1/5 YR	NA
641		PCB-1242	608	1.0		G	1/5 YR	NA
642		PCB-1254	608	1.0		G	1/5 YR	NA
643		PCB-1221	608	1.0		G	1/5 YR	NA
644		PCB-1232	608	1.0		G	1/5 YR	NA
645		PCB-1248	608	1.0		G	1/5 YR	NA
618	39508	PCB-1260	608	1.0		G	1/5 YR	NA
646		PCB-1016	608	1.0		G	1/5 YR	NA
349	39400	Toxaphene	608	5.0		G	1/5 YR	NA
BASE NEUTRAL EXTRACTABLES								
		Acenaphthene	625	10.0		G	1/5 YR	NA
275	34222	Anthracene	625	10.0		G	1/5 YR	NA
276	34526	Benzo(a)anthracene	625	10.0		G	1/5 YR	NA
648		Benzo(b)fluoranthene	625	10.0		G	1/5 YR	NA
278	34242	Benzo(k)fluoranthene	625	10.0		G	1/5 YR	NA
277	34247	Benzo(a)pyrene	625	10.0		G	1/5 YR	NA
		Butyl benzyl phthalate	625	10.0		G	1/5 YR	NA

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WATER QUALITY MONITORING
ATTACHMENT D

FACILITY NAME: Omega Protein
ADDRESS: P.O. Box 125, Reedville, Va. 22539

PERMIT NO.: VA0003867 OUTFALL NO.:

DEQ PAR- AM #	EPA PAR- AM #	CHEMICAL	EPA ANAL- YSIS NO.	QUANTIFI- CATION LEVEL ⁽¹⁾	REPORT- ING RESULTS	SAM- PLE TYPE ⁽²⁾	SAMPLE FRE- QUENCY ⁽³⁾	SPECIFIC TARGET VALUE ⁽⁴⁾ ug/l
282	34320	Chrysene	625	10.0		G	1/5 YR	NA
654		Dibenz(a,h)anthracene	625	20.0		G	1/5 YR	NA
		Dibutyl phthalate	625	10.0		G	1/5 YR	NA
259	34536	1,2-Dichlorobenzene	625	10.0		G	1/5 YR	NA
264	34566	1,3-Dichlorobenzene	625	10.0		G	1/5 YR	NA
266	34571	1,4-Dichlorobenzene	625	10.0		G	1/5 YR	NA
		Diethyl phthalate	625	10.0		G	1/5 YR	NA
170		Di-2-Ethylhexyl Phthalate	625	10.0		G	1/5 YR	NA
239	34611	2,4-Dinitrotoluene	625	10.0		G	1/5 YR	NA
287	34376	Fluoranthene	625	10.0		G	1/5 YR	NA
288	34381	Fluorene	625	10.0		G	1/5 YR	NA
651		Indeno(1,2,3-cd) pyrene	625	20.0		G	1/5 YR	NA
650		Isophorone	625	10.0		G	1/5 YR	NA
293	34696	Naphthalene	625	10.0		G	1/5 YR	NA
		Nitrobenzene	625	10.0		G	1/5 YR	NA
296	34469	Pyrene	625	10.0		G	1/5 YR	NA
		1,2,4 Trichlorobenzene	625	10.0		G	1/5 YR	NA
VOLATILES								
216	34030	Benzene	624	10.0		G	1/5 YR	NA
484	32104	Bromoform	624	10.0		G	1/5 YR	NA

DEPARTMENT OF ENVIRONMENTAL QUALITY
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ADDRESS: P.O. Box 125, Reedville, Va. 22539

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OUTFALL NO.:

DEQ PAR- AM #	EPA PAR- AM #	CHEMICAL	EPA ANAL- YSIS NO.	QUANTIFI- CATION LEVEL ⁽¹⁾	REPORT- ING RESULTS	SAM- PLE TYPE ⁽²⁾	SAMPLE FRE- QUENCY ⁽³⁾	SPECIFIC TARGET VALUE ⁽⁴⁾ ug/l
236	32102	Carbon Tetrachloride	624	10.0		G	1/5 YR	NA
652		Chlorodibromo- methane	624	10.0		G	1/5 YR	NA
223	32106	Chloroform	624	10.0		G	1/5 YR	NA
649		Dichloromethane	624	20.0		G	1/5 YR	NA
244	79603	Dichlorobromo- methane	624	20.0		G	1/5 YR	NA
260	34531	1,2-Dichloroethane	624	10.0		G	1/5 YR	NA
		1,1-Dichloroethylene	624	10.0		G	1/5 YR	NA
172	34371	Ethylbenzene	624	10.0		G	1/5 YR	NA
653		Monochlorobenzene	624	50.0		G	1/5 YR	NA
220	34475	Tetrachloroethylene	624	10.0		G	1/5 YR	NA
222	34010	Toluene	624	10.0		G	1/5 YR	NA
155	39180	Trichloroethylene	624	10.0		G	1/5 YR	NA
173	39175	Vinyl Chloride	624	10.0		G	1/5 YR	NA
ACIDS EXTRACTABLES								
		2-Chlorophenol	625	10.0		G	1/5 YR	NA
		2,4 Dichlorophenol	625	10.0		G	1/5 YR	NA
		2,4 Dimethylphenol	625	10.0		G	1/5 YR	NA
210	39032	Pentachlorophenol	625	50.0		G	1/5 YR	NA
175	46000	Phenol ⁽⁶⁾	625	10.0		G	1/5 YR	NA
602	34621	2,4,6-Trichlorophenol	625	10.0		G	1/5 YR	NA

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PERMIT NO.: VA0003867 OUTFALL NO.:

DEQ PAR- AM #	EPA PAR- AM #	CHEMICAL	EPA ANAL- YSIS NO.	QUANTIFI- CATION LEVEL ⁽¹⁾	REPORT- ING RESULTS	SAM- PLE TYPE ⁽²⁾	SAMPLE FRE- QUENCY ⁽³⁾	SPECIFIC TARGET VALUE ⁽⁴⁾ ug/l
MISCELLANEOUS								
039	00610	Ammonia as NH3-N	350.1	200		C	1/5 YR	NA
005	50060	Chlorine, Total Residual	(6)	100		G	1/5 YR	NA
018	00720	Cyanide	335.2	10.0		G	1/5 YR	NA
		Fecal Coliform N/CML)	(6)	(7)		G	1/5 YR	NA
		Hydrogen Sulfide	(6)	(7)		G	1/5 YR	NA
350	30340	Tributlytin ⁽⁹⁾	NSBR 85-3295	(7)		C	1/5 YR	NA
252	81551	Xylenes (total)	SW 846 Method 8021B or 8260B	0.2		G	1/5 YR	NA

Name of Principal Exec. Officer or Authorized Agent / Title

Signature of Principal Officer or Authorized Agent / Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. Section 1001 and 33 U.S.C. Section 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years.)

Footnotes to Water Quality Monitoring Attachment

- (1) Quantification level (QL) is defined as the lowest concentration used for the calibration of a measurement system when the calibration is in accordance with the procedures published for the required method.

Units for the quantification level and the specific target value are micrograms/liter unless otherwise specified.

Quality control and quality assurance information shall be submitted to document that the required quantification level has been attained.

- (2) Sample Type

G = Grab = An individual sample collected in less than fifteen (15) minutes. Substances specified with "grab" sample type shall only be collected as grabs. The permittee may analyze multiple grabs and report the average results provided that the individual grab results are also reported.

C = Composite = A 24-hour composite unless otherwise specified. The composite shall be a combination of individual samples, taken proportional to flow, obtained at hourly or smaller time intervals. The individual samples may be of equal volume for flows that do not vary by +/- 10 percent over a 24-hour period. For composite metals samples, the individual sample aliquots shall be filtered and preserved immediately upon collection and prior to compositing.

- (3) Frequency

1/5 YR = once after the start of the third year from the permit's effective date
X = no monitoring required

- (4) Specific Target Value is the approximate value that may initiate a wasteload allocation analysis. Target values are not wasteload allocations or effluent limitations. The specific target values are subject to change based on additional information such as hardness data, receiving stream flow and design flows.

- (5) A specific analytical method is not specified. An appropriate method shall be selected from the following list of EPA methods (or any approved method presented in 40 CFR Part 136) which will achieve a quantification level that is less than the indicated specific target value for each metal. If the test result is less than the specified specific target value, a "<[QL]" shall be reported where the actual analytical test QL is substituted for [QL].

Metal	Analytical Methods
Antimony	204.1; 200.7; 204.2; 1639; 1638; 200.8
Arsenic	200.7; 200.9; 200.8; 1632
Barium	208.1; 200.7; 208.2; 200.8
Cadmium	213.1; 200.7; 213.2; 200.9; 200.8; 1638; 1639; 1637; 1640
Chromium*	218.1; 200.7; 218.2; 218.3; 200.9; 1639; 200.8
Chromium VI	218.4; 1636
Copper	220.1; 200.7; 220.2; 200.9; 1638; 1640; 200.8
Iron	236.1; 200.7; 236.2
Lead	239.1; 200.7; 239.2; 200.9; 200.8; 1638; 1637; 1640
Manganese	243.1; 200.7; 200.9; 243.2; 200.8
Mercury	200.7; 245.1; 200.8; 1631
Nickel	249.1; 200.7; 249.2; 1639; 200.9; 1638; 200.8; 1640
Selenium	200.7; 270.2; 200.8; 1638; 1639; 200.9
Silver	272.1; 200.7; 200.9; 272.2; 1638; 200.8
Zinc	289.1; 200.7; 1638; 1639; 200.8; 289.2

- * Chromium III is measured by the total chromium analysis. If the result of the total chromium analysis is less than or equal to the QL (or specific target value), the result for chromium III can be reported as less than QL.
- (6) Any approved method presented in 40 CFR part 136.
- (7) The QL is at the discretion of the permittee. For any substances addressed in 40 CFR Part 136, the permittee shall use one of the approved methods in 40 CFR Part 136.
- (8) Requires continuous extraction.
- (9) DEQ's approved analysis for TBT may also be used [See A Manual for the Analysis of Butyltins in Environmental Systems by the Virginia Institute of Marine Science dated November 1996].
- (10) SW846 Method 8270 C, provided the lab has an Initial Demonstration of Capability, has passed a Performance Test for Kepone, and meets the criteria given in Method 8270 C.

16. Compliance Schedule

The permittee shall achieve compliance with the final limits and monitoring requirements for enterococci at 001, 002 and 004/005 and Total Recoverable Copper at outfall 004/005 as specified in this permit in accordance with the following schedule:

SCHEDULE OF COMPLIANCE FOR ENTEROCOCCI AND TOTAL RECOVERABLE COPPER

1. Initiate plans for compliance	Within 90 days after the effective date of permit reissuance.
2. Report of progress to DEQ	Quarterly.
3. Achieve Compliance with Effluent Limitations.	Within 4 years of the effective date of permit reissuance.

No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit to the Department's staff, either a report of progress, or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

17. Oil Storage Ground Water Monitoring Reopener. As this facility currently manages ground water in accordance with 9 VAC 25-90-10 et seq., Oil Discharge Contingency Plans and Administration Fees for Approval, this permit does not presently impose ground water monitoring requirements. However, this permit may be modified or alternatively revoked and reissued to include ground water monitoring not required by the ODCP regulation.
18. This permit shall be modified or alternatively revoked and reissued if any approved wasteload allocation procedure, pursuant to Section 303(d) of the Clean Water Act, imposes wasteload allocations, limits or conditions on the facility that are not consistent with the permit requirements.

C. OTHER REQUIREMENTS AND SPECIAL CONDITIONS

1. Toxics Management Program

a. Biological Monitoring (Outfall 003):

- (1) If the permittee elects to discharge effluent (evaporator condensate only) via outfall 003, then the following testing will be required for each discharge event until the first four discharge events have occurred:

Two acute toxicity tests using grab samples of final effluent from outfall 003. The acute tests shall be 48-hour static tests using Cyprinodon variegatus and Mysidopsis bahia, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC_{50} .

- (2) The following criterion shall be used in evaluating the toxicity test data generated in (1) above:

LC_{50} greater than or equal to 100% effluent concentration in six of the total of eight acute toxicity tests

- (3) If effluent from outfall 003 fails the above criterion it shall be considered to have demonstrated actual or potential toxicity. Accordingly, continued discharge of this effluent via outfall 003 shall be prohibited. In order to resume discharging from this outfall the permittee must:

- (a) assure the absence of actual or potential toxicity, or
- (b) demonstrate that there is, or would be, no adverse impact from the discharge on all reasonable and beneficial uses of the state's waters.

b. Biological Monitoring (Outfall 001):

- (1) The permittee shall conduct quarterly acute and chronic toxicity tests for a period of one year using 24-hour flow-proportioned samples of final effluent from outfall 001. The quarters shall be defined by the seasonal operation of the facility: First Quarter: May-July; Second Quarter: August-October; Third Quarter: November-January; Fourth Quarter: February-April. The acute tests shall be 48-hour static tests using Mysidopsis bahia and Cyprinodon variegatus, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC_{50} . The chronic tests shall be static renewal tests using M. bahia and C. variegatus. The M. bahia test shall be a 7-day larval survival, growth and/or fecundity test, and the C. variegatus test shall be a 7-day larval survival and growth test. These chronic tests shall be conducted in such a manner and at sufficient dilutions to determine the "No Observed Effect Concentration" (NOEC) for survival and reproduction or growth. The permittee may provide additional samples to address data variability. These data may be included in the evaluation of effluent toxicity. The results of all such additional analyses shall be reported. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality staff, if requested by the permittee. Test protocols and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

- (2) The following criteria shall be used in evaluating the toxicity test data generated in I.C.1.b. (1) above:

- (a) LC_{50} greater than or equal to 7% effluent in six of the total of eight acute

toxicity tests, or in at least 75% of the tests conducted, if more than eight tests are conducted.

- (b) No Observed Effect Concentration (NOEC) greater than or equal to the Instream Waste Concentration (IWC) of 0.9%, in six of the total of eight toxicity tests, or in at least 75% of the tests if more than eight tests are conducted.

Any effluent failing either of the above criteria shall be considered to have demonstrated actual or potential toxicity and a WET limit will be required. In the event the plant is not operating during one of the reporting quarters, the permittee shall submit a statement along with the DMR for the following month, and continue testing as in I. C.1.b. (2) (a) and (b) above until the required number of tests have been completed.

- (3) If, prior to completing the monitoring requirements specified in I. C.1.b. (1) above, it is determined that the effluent fails the decision criteria outlined in I. C.1.b. (2), the effluent shall be considered to have demonstrated actual potential toxicity and a Whole Effluent Toxicity (WET) limit and a compliance period will be required.
- (4) Following successful completion of the testing of outfall 001 as in I. C.1.b. (1) above, the permittee shall resume annual acute and chronic toxicity testing of the outfall. The first annual tests shall be conducted within 30 days of initial annual discharge from the outfall following completion of the last quarterly tests. The test organisms shall be those identified as the most sensitive species from the quarterly acute and chronic tests, or alternative species approved by the Department of Environmental Quality staff. Annual testing of the outfall is not required in cases where the need for a WET limit of the outfall has been established.
- (5) If, in the testing according to I.C.1.b. (4) above, any of the annual acute toxicity tests yields an LC_{50} of less than 7% effluent, or any of the annual chronic tests yields an NOEC less than the IWC of 0.9%, the test shall be repeated within three months.
 - (a) If the retest also indicates an LC_{50} of less than 7% effluent or an NOEC less than the IWC, quarterly toxicity testing as in I. C.1.b. (1) above shall commence within three months. The results of these tests will be included in the evaluation of the need for toxicity reduction and a WET limit.
 - (b) If the retest does not confirm the results of the first test, then annual testing in accordance with the annual compliance schedule shall resume.

c. Biological Monitoring (Outfall 004/005):

- (1) The permittee shall conduct quarterly acute and chronic toxicity tests for a period of one year using 24-hour flow-proportioned samples of final effluent from outfall 004/005. The quarters shall be defined by the seasonal operation of the facility: First Quarter: May-July; Second Quarter: August-October; Third Quarter: November-January; Fourth Quarter: February-April. The acute tests shall be 48-hour static tests using Mysidopsis bahia and Cyprinodon variegatus, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC_{50} . The chronic tests shall be static renewal tests using M. bahia and C. variegatus. The M. bahia test shall be a 7-day larval survival, growth and/or fecundity test, and the C. variegatus test shall be a 7-day larval survival and growth test. These chronic tests shall be

conducted in such a manner and at sufficient dilutions to determine the "No Observed Effect Concentration" (NOEC) for survival and reproduction or growth. The permittee may provide additional samples to address data variability. These data may be included in the evaluation of effluent toxicity. The results of all such additional analyses shall be reported. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality staff, if requested by the permittee. Test protocols and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

- (2) The following criteria shall be used in evaluating the toxicity test data generated in I.C.1.c. (1) above:

- (a) LC_{50} greater than or equal to 100% effluent in six of the total of eight acute toxicity tests, or in at least 75% of the tests conducted, if more than eight tests are conducted.
- (b) No Observed Effect Concentration (NOEC) greater than or equal to the Instream Waste Concentration (IWC) of 2%, in six of the total of eight toxicity tests, or in at least 75% of the tests if more than eight tests are conducted.

Any effluent failing either of the above criteria shall be considered to have demonstrated actual or potential toxicity and a WET limit will be required. In the event the plant is not operating during one of the reporting quarters, the permittee shall submit a statement along with the DMR for the following month, and continue testing as in I.C.1.c. (2) (a) and (b) above until the required number of tests have been completed.

- (3) If, prior to completing the monitoring requirements specified in I. C.1.c. (1) above, it is determined that the effluent fails the decision criteria outlined in C.1.c. (2), the effluent shall be considered to have demonstrated actual potential toxicity and a Whole Effluent Toxicity (WET) limit and a compliance period will be required.
- (4) Following successful completion of the testing of outfall 004/005 as in I.C.1.c. (1) above, the permittee shall resume annual acute and chronic toxicity testing of the outfall. The first annual tests shall be conducted within 30 days of initial annual discharge from the outfall following completion of the last quarterly tests. The test organisms shall be those identified as the most sensitive species from the quarterly acute and chronic tests, or alternative species approved by the Department of Environmental Quality staff. Annual testing of the outfall is not required in cases where the need for a WET limit of the outfall has been established.
- (5) If, in the testing according to I.C.1.c. (4) above, any of the annual acute toxicity tests yields an LC_{50} of less than 100% effluent, or any of the annual chronic tests yields an NOEC less than the IWC of 2%, the test shall be repeated within three months.
 - (a) If the retest also indicates an LC_{50} of less than 100% effluent or an NOEC less than the IWC, quarterly toxicity testing as in C.1.b. (1) above shall commence within three months. The results of these tests will be included in the evaluation of the need for toxicity reduction and a WET limit.
 - (b) If the retest does not confirm the results of the first test, then annual testing in accordance with the annual compliance schedule shall resume.

VPDES PERMIT PROGRAM FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a major industrial permit. Omega Protein, formerly Zapata Protein, Inc., processes menhaden by cooking the fish, pressing and separating the oil and solids, and evaporating the water to leave fish meal and oil.

The 001 discharge to Cockrell's Creek results from the operation of contact cooling water for the air pollution scrubbers. The 002 discharge to Cockrell's Creek results from the operation of the aerated lagoons for treating the fish condensate. The 003 discharge results from the barge disposal of fish condensate in designated area of the Chesapeake Bay. This method of disposal has not been used in over 15 years, but it is retained in case of emergency. The 004 discharge is non-contact cooling water for the evaporators used in the processing of the fish condensate. 005 is a new non-contact cooling water discharge from the new evaporator, placed online September, 1998. In the previous permit, 006 was a combined contact cooling water and non-contact cooling water outfall that was created in the winter of 2000; it combined 001+004+005 and provide aeration to decrease ammonia. However, it has been modified again during the winter of 2002 to separate the contact from the non-contact cooling waters.

Now the outfall configuration is 001 again and the combination of 004+005 (the non-contact cooling waters) only. This permit action also allows the location of the shipyard activity at both the Reedville side of the creek and the Fairport side. The refrigeration water is the chilled water from the hold of the ships which cools the fish until they are unloaded at the dock. The ships then dispose of the water east of a line between Fleeton Point Light and Black Can Buoy No. 3. In 1997, Zapata Protein bought Ampro Fisheries, another menhaden fishing operation, located across the Creek in Fairport. Ampro Fisheries was shut down. A permit modification after the purchase incorporated Ampro's wasteload allocation in Cockrell's Creek with Omega's permit limitations.

1. Facility Name and Address: SIC Code: 2077

Omega Protein
P.O. Box 175
Reedville, Va. 22539

Location: VSH 659, Reedville, Va. 22539

2. Permit No. VA0003867 Expiration Date: December 17, 2002

3. Owner Contact: Name: Lyell Jett
Title: General Manager
Telephone #: 804-453-4211

4. Application Complete Date: February 14, 2003
Permit Drafted By: D. M. Mosca Date: February 21, 2003

DEQ Regional Office: Kilmarnock Field Office of Piedmont Regional Office

Reviewed by: Debra J. Barnes, RO Date: 3-18-03
Curthinderman Date: 3-20-03

Public Comment Period Dates: from _____ to _____

5. Receiving Waters Classification: (refer to topo map Attachment 1)

Receiving Stream: Cockrell's Creek River Mile: 1.00
Basin: Chesapeake Bay/Atlantic/Small Coastal
Subbasin: N/A
Section: 2 Class: II
Special Standards: a, NEW-20
7-Day, 10-Year Low Flow: (N/A: Saltwater)
Tidal? YES On 303D list? YES

6. Operator Requirements: Class III
 7. Reliability Class Designation: None (not a sewage discharge)
 8. Permit Characterization: (Check as many as necessary)
- | | |
|---|---|
| <input checked="" type="checkbox"/> Private | <input checked="" type="checkbox"/> Effluent Limited* |
| <input type="checkbox"/> Federal | <input checked="" type="checkbox"/> Water Quality Limited** |
| <input type="checkbox"/> State | <input checked="" type="checkbox"/> Toxics Monitoring Program Required*** |
| <input type="checkbox"/> POTW | <input type="checkbox"/> Pretreatment Program Required |
| | <input type="checkbox"/> Possible Interstate Effect |
| | <input checked="" type="checkbox"/> Compliance Schedule Required |
| | <input type="checkbox"/> Interim Limits in Permit |
| | <input type="checkbox"/> Interim Limits in Other Document |

9. **Attachment 2** is a schematic of Wastewater Treatment System.

Table I
 NUMBER AND DESCRIPTION OF DISCHARGES

OUTFALL NUMBER AND LOCATION	SOURCE OF DISCHARGE (LIST OPERATION CONTRIBUTING FLOW)	TREATMENT (BRIEF DESCRIPTION UNIT BY UNIT)	FLOW AVERAGE/MAXIMUM (GIVE AVG & MAX FOR INDUSTRY & DESIGN FOR MUNICIPAL)
001 Cockrell's Creek (Attachment 2d) 37 49 48 76 16 42	Processing Menhaden: Contact Cooling water from Dryer Scrubbers; Emergency Discharge of Evaporation Condensate	Evaporation	3.037 MGD long term average, 3.821 max 30 day value MGD; 4.14 MGD maximum daily flow
002 Cockrell's Creek 37 49 30 76 16 32	Processing Menhaden: the aerated lagoon treatment of the condensate.	Aeration, detention	0.249 MGD max 30 day flow, 0.210 MGD long term avg flow; 0.481 MGD maximum daily flow
003 Chesapeake Bay 37 30 01 76 12 40	Processing Menhaden: Evaporation Condensate.	Evaporation	0.3 MGD long term avg. flow, 0.4 MGD max (measured in barge- fuls of condensate, at 0.2 MGD per barge)

OUTFALL NUMBER AND LOCATION	SOURCE OF DISCHARGE (LIST OPERATION CONTRIBUTING FLOW)	TREATMENT (BRIEF DESCRIPTION UNIT BY UNIT)	FLOW AVERAGE/MAXIMUM (GIVE AVG & MAX FOR INDUSTRY & DESIGN FOR MUNICIPAL)
(Combines 004+005) Cockrell's Creek (Attachment 2c) 37 49 48 76 16 40	Processing Menhaden: Non- contact Cooling water from Evaporation Units	Evaporation	7.1 MGD max 30 day average flow; long term average flow 5.64 MGD, 14.2 MGD maximum daily flow
East of Fleton Point Light and Black Can Buoy #3 (Attachment 2e)	refrigeration water (from ships)	None	Unknown: subject to criteria that the discharge be made while the ship is underway and at a rate such that the discharge is not visible.
Stormwater handled by General Permit	Stormwater Monitoring at Outfall 001	None	Monitored under general permit VAR540298 for Reedville side; VAR540312 for Fairport side

Bailwater is creekwater used to transfer the fish off the boat hydraulically to shore at the dock. The bailwater goes through the process so what water is not evaporated is discharged through outfall 001.

The boat engines require cooling water and a discharge of the engine cooling water may be seen at the dock if the engines are running waiting to unload the fish catch.

Stickwater is wastewater from the fish cooker that has been pressed and centrifuged. It consists of 10 percent solids. It is further evaporated to condensate, which is 50 percent solids. The condensate is treated with the aerated lagoon and discharged to Cockrell's Creek at outfall 002.

The 003 wastewater is barged out to a designated quadrant in the Bay, diluted with seawater, and discharged below the barge. This method of disposal has not been used in over 15 years, but it is retained in case of emergency. Sufficient dilution is possible provided the barge discharge pumps dilute the wastewater with seawater such that no water quality violations are expected. This information must be documented and submitted to DEQ with the monthly reports. Refrigeration water is used to cool the fish as they are brought to the plant for processing. After the ships drop off their menhaden catch, they head back out to fish. Once they reach a point east of a line between Fleton Point Light and Black Can Buoy No. 3, they discharge the refrigeration water in compliance with water quality standards while the vessel is underway and at such a rate that the discharge is not visible.

10. Sewage Sludge Use or Disposal: NA
11. Discharge Location Description: See **Attachment 1** for Reedville topo map.
12. Material Storage: List the type and quantity of wastes, fluids, or pollutants being stored at this facility. Briefly describe the storage facilities and list any measures taken to prevent the stored material from

reaching state waters.

- A. Marine Paints for touchup work on the menhaden boats. Brushwork only, instead of spraying, is done at this facility.
- B. Sulfuric Acid for the scrubbers. The acid is stored so that it does not come in contact with stormwater or wastewater.
- C. Oils in ASTs. These are stored inside bermed areas in case of leakage of one of the tanks.

12. Receiving Waters Information:

The Cockrell's Creek waterbody encompasses the area southeast and east of Lillian on Rte. 360 to the confluence with Ingram Bay and Chesapeake Bay, including Cockrell Creek's and numerous unnamed coves. This waterbody is classified as effluent limited. The DEQ maintains an AWQM station near Reedville (COC001.61). The 2002 305b Report to Congress shows no temperature, 2 D.O., no pH, one fecal coliform and 5 chlorophyll violations. Historically, this station has shown low dissolved oxygen levels, which have been attributed to seasonal problems. However, during this reporting period, only 3% of the samples violated the standard [2 D.O. violations out of a possible 66]. The 2002 report noted lead detected in fish tissue at a station upstream from the AWQM station. Waters exceeding a single state screening value (SV) found in Tables 6(a) or 6(b) of the 305(b) report for fish tissue or Effects Range-Medium (ER-M) value for sediment, are fully supporting but threatened for fish consumption and aquatic life, respectively.

Shellfish condemnations are associated with the buffer zone surrounding the discharge from the Town of Reedville WWTP and non-point source pollutants. Two seafood fish-packing facilities, Pride of Virginia and Reedville Menhaden presently discharge to Cockrell's Creek, in addition to the menhaden plant.

In addition to the information about Cockrell's Creek, the Chesapeake Bay is the discharge location for outfall 003 and refrigeration water. The Chesapeake Bay and its tidal tributaries, HUC 02080102, is designated as nutrient enriched, source unknown. The northwest Chesapeake Bay, HUC 02080101, is impaired for dissolved oxygen and turbidity due to nonpoint sources, and is also designated as nutrient enriched, due to stratification. The segment is also threatened for the Clean Water Act's Aquatic Life Use Support Goal because greater than 25% of probabilistically sited benthic stations exceeded the threshold of 2.0. Both of the cited Chesapeake Bay segments are partially supporting for aquatic life use for these reasons.

14. Antidegradation Review and Comments.

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters. The limitations in this permit were developed in accordance with Section 303(d)(4) of the Clean Water Act. Therefore, antidegradation restrictions do not apply.

Cockrell Creek is a tier one stream, considered fully allocated, based on the VIMS model and supporting documentation. The model was performed to model the creek for the menhaden plant limitations and showed a wasteload allocation of 5000 lb/day BOD₅. This wasteload allocation was split between the two

menhaden plants on the creek at the time, and an amount (100 lb/day) was delegated to the Reedville WWTP. The Chesapeake Bay is considered tier one because it is on the 1998 adopted and proposed 2002 section 303(d) lists of impaired waters for nutrients and low D.O (Attachment 2f).

15. Site Inspection: The site inspection was performed on September 12, 2001 by Steven Stell. **(Attachment 3).**

16. Effluent Screening and Limitation Development:

- Technology Based Limits: 40 CFR Part 408.150 (Subpart O Fish Meal Processing Subcategory), BPJ,BEJ (These were never adopted) See Attachment 4 (Table IV)
- Water Quality Based Limits: See also Table IV. EPA requirements require metals limits to be in the form of total recoverable metals, whereas the standards are shown as the dissolved form. For this reason, when our objective is to get more data to evaluate, when monitoring is placed in the permit, metals must be in the dissolved form. We can use total recoverable data to rule out the need for a limit, but we cannot impose one based upon that type of data. We assume a 1:1 ratio between total recoverable and dissolved metals. This is the reason why the metals are in the form of dissolved at 001 and 003 and total recoverable at 004/005.
- Limitations and monitoring for stormwater are required under the VPDES permit regulation, 9 VAC 25-31-220A, and EPA's storm water effluent limitation guidelines in the Code of Federal Regulations at 40 CFR Part 429, Part 418, Part 443, Part 411, and Part 423. **Omega Protein has two stormwater general permits, for the Fairport side of Cockrell's Creek (formerly the Ampro plant) and the Reedville location (formerly Zapata Haynie).**
- Evaluation of existing effluent data to determine the need for water quality based limits or toxics monitoring. **See Attachment 5 (See also Tables V-VIII).** Fecal coliform has shown up in high values in the permit application at the Cockrell's Creek outfalls (001: 1600 max daily value, 1250 long term avg and max. 30 day value; 002: 500 max daily value, 335 long term avg, 004/005 240 max daily value, 145 max 30 day avg.; all units N/100 ml). enterococci limits were imposed at these outfalls in accordance with a schedule of compliance. The assumption was made that enterococci were present due to high fecal bacterial levels. Fecal coliform is an indicator organism of bacteria from the intestinal tract of humans and animals. New agency guidance to test for enterococci has been applied in accordance with the schedule of compliance.
- Stream Flow Basis for wasteload allocations **In the absence of other data, agency defaults have been used.**
- Calculations of wasteload allocations **See, Attachment 5.**
- Computer printout of the WLA.exe and MIX.exe computer programs. **See Attachment 5.**
- Provide a rationale for limiting internal waste streams, indicator pollutants and sewage sludge use and disposal requirements. **NA**
- Explanation if pollutants reported on Form 2C in quantifiable amounts are not limited in the permit. **NA**
- Attach a copy of the DMR to the Fact Sheet. **See Attachment 6.**

Basis for Effluent Limitations

001 (Contact cooling water)

Parameter	Basis
Flow	7
pH	7
BOD	5
Total Suspended Solids	4
Oil and Grease	7
Total Phosphorus	6
Total Nitrogen	6
Ammonia-Nitrogen	5
Cyanide	5
Temperature	4
Dissolved Silver	5
enterococci	4
Chlorine Produced Oxidant	5

Basis for Effluent Limitations

002 Process Wastewater (Lagoon Effluent)

Parameter	Basis
Flow	7
pH	4
Total Suspended Solids	7
Temperature	7
Oil and Grease	7
Ammonia	5
WET Limit	DEQ Toxic Management Guidance
enterococci	4
BOD	5

Basis for Effluent Limitations

003 Process Wastewater (Chesapeake Bay Discharge)

Parameter	Basis
Flow	7
pH	4
Total Suspended Solids	7
Temperature	7
Oil and Grease	7
Ammonia	5
Dissolved Oxygen	7
Dissolved Copper	8
BOD	5

Basis for Effluent Limitations

004/005 Non-Process Wastewater (non-contact cooling water)

Parameter	Basis
Flow	7
pH	4
Total Phosphorus	6
Total Nitrogen	6
Ammonia-Nitrogen	5
Total Recoverable Copper	5
enterococci	4
Temperature	7

Basis Key:

- 1 Per 208 Plan and Date
- 2 Per 303(e) Plan and Date
- 3 Per 401 Certification and Date
- 4 SWCB Water Quality Standards
- 5 Model
- 6 SWCB Nutrient Policy
- 7 Best Engineering Judgement

17. Antibacksliding Statement: Rationale for relaxed limits: In accordance with Section 303(d)(4)(b) of the Clean Water Act, the water quality standards are being maintained in the receiving stream, and any revisions of water quality limitations are permissible if they are consistent with antidegradation policies under Section 302 (d) (4) (B). See Attachment 7. **Ammonia and cyanide limitations were readjusted at 001 in accordance with new guidance, new mixing analyses of Cockrell's Creek/diffuser. New evaluation criteria (LC50, NOEC) were determined for the Biological Monitoring at 001 and 003 as well for the same reason. The WET limit at outfall 002 is being revised to account for the diffuser in place there since June, 2000.**
18. Compliance Schedules:
 The permittee shall achieve compliance with the final limits and monitoring requirements for total recoverable copper at 004/005 and enterococci at 001, 002 and 004/005 as specified in this permit in accordance with the following schedule:

SCHEDULE OF COMPLIANCE FOR
 enterococci at 001, 002 and 004/005 and Total Recoverable Copper at 004/005

1. Initiate design of facilities	Within 90 days after permit reissuance..
2. Report of progress to DEQ	Quarterly.
3. Achieve Compliance with Effluent Limitations.	Within 4 years of permit reissuance.

No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall

submit to the Department's staff, either a report of progress, or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

19. Special Conditions:

- B.1. Quantification Levels for Toxic Parameters--from Quantification Guidance dated August, 1999. States are authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per 40 CFR Part 130, Water Quality Planning and Management, subpart 130.4.
- B.2. Bay Discharge (003) Requirements - based on the previous permit. Monitoring required to ensure discharges meet water quality standards.
- B.3. Refrigeration Water Discharge Requirements - based on the previous permit. Monitoring required to ensure discharges meet water quality standards.
- B.4. Instream Monitoring - Because the ammonia standards for 001, 002 and 004/005 have been calculated with 10 years of environmental data instead of the period of record, the permittee has agreed to instream monitoring for ammonia, temperature, pH and salinity to ensure that water quality standards are not violated. Includes a permit reopener for addressing any water quality violations.
- B.5. Additional Guidance for Bacterial Disinfection. Added per Guidance memo 03-2007, to apply to 001, 002 and 004/005. On January 14, 2003, new bacterial standards in 9 VAC 25-260-170.A became effective, as did the revised disinfection policy of 9 VAC 25-260-170B. These standards replaced the existing fecal coliform standard and disinfection policy of 9 VAC 25-160-170. The condition is customized because of the direct implementation of the enterococci limit for an industrial permit in accordance with the schedule of compliance, only the sampling protocols apply. The addition of chlorine at 001 is considered to be addressing the cyanide at that outfall only and not for bacterial removal.
- B.6. Notification levels of Toxics - Required by VPDES Permit Regulation, 9 VAC 25-31-200A for all manufacturing, commercial, mining, and silvicultural dischargers.
- B.7. Materials Handling/Storage. 9 VAC 25-31-50, Section A. prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia Section 62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.
- B.8. Nutrient Enriched Waters. Policy for Nutrient Enriched Waters, 9 VAC 25-40-10 et seq. allows reopening of permits for discharges into waters designated as nutrient enriched if total phosphorus and total nitrogen in a discharge potentially exceed specified concentrations. The policy also anticipates that future nutrient limits may be needed to control aquatic plants.
- B.9. Operations and Maintenance Manual. Required by Code of Virginia Section 62.1-44.16; VPDES Permit Regulation, 9 VAC 25-31-190, Section E. and 40 CFR 122.41(e). These require proper operation and maintenance of the permitted facility. Compliance with an approved O&M manual ensures this.
- B.10. Licensed Operator Requirement. Required by VPDES Permit Regulation 9 VAC-25-31-200D and The Code of Virginia 54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.) requires licensure of operators.
- B.11. 2C Application form for 003 discharge. The permittee must complete and submit to DEQ Item V and VI of Form 2C for outfall 003 within 30 days of the first discharge from the outfall. The permit limitations are based upon assumed water quality effluent characteristics that can only be validated with actual effluent data. The submission of actual data is required in the application form instructions. This condition is an adaptation of a condition from the permit manual used for a facility that has not been constructed and therefore cannot submit sampling data; it was modified because of the similar situation with the 003 outfall that has not been used. A 30-day completion of the application was selected instead of the 2 years allowed in the permit manual because of the need for a tighter feedback mechanism to evaluate the effectiveness of the controls.
- B.12. Lagoon Salinity Profile. Salinity checks from the laboratory upon receipt of TMP samples from

002 showed salinities that varied from 0 ppt-20 ppt, whereas the fish condensate that is sent to the lagoon is not expected to have any appreciable salinity. Our inspector took a sample of the lagoon effluent on October 10, 2002 and measured a salinity of 0.56 ppt. The company responded that a gasket had failed on the condensate plate heat exchangers, dumping salt water into the lagoon regularly, and that it should now be fixed. A salinity profile of the lagoon will be helpful to assess if the lagoon still contains salty water and where the location of it is. The profile will allow us to evaluate the appropriateness of Omega Protein's sampling.

- B.13. Chlorine in cyanide removal process. Omega will be installing facilities to remove cyanide, using chlorine in accordance with the 2003 consent order. This condition establishes a chlorine limit that will become effective upon approval of a plan and schedule by DEQ.
- B.14. Best Management Practices: Fairport and Reedville Locations Off Season Maintenance Areas. Because this facility performs touch-up scraping and painting of boats over water at the locations shown in Permit Attachment B, the shipyard BMPs have been maintained in this permit, along with a reporting form (Permit Attachment C). The previous permit had the BMPs applicable to the Reedville side of Cockrell's Creek, and this permit application now proposes to expand the location to the other side as well. This facility does not use TBT so no limits have been assigned. However, a one-time sampling of the soil, sediment and water column at the boat maintenance areas has been instituted to show that water quality standards will be maintained due to past practices at the facility. (I.B.15, below) No COD sampling has been included due to the chloride interference with this test expected with salt water. VPDES Permit Regulation, 9 VAC25-31-220K, requires the use of best management practices where applicable to control or abate the discharge of pollutants when numeric effluent limits are infeasible or the practices are necessary to achieve effluent limit or to carry out the purpose and intent of the Clean Water Act and State Water Control Law. (Attachment 7b).
- B.15. Soil/Sediment and Water Column Testing of Boat Maintenance Areas. This is for the permittee to perform a one time sampling of the soil, sediment and water column at the Boat Maintenance Areas. The sampling will demonstrate if past practices are causing current water quality problems that may need to be addressed by a limit. A permit reopener clause is also included.
- B.16. Water Quality Criteria Monitoring. State Water Control Law Section 62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. To ensure that water quality standards are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Permit Attachment D.
- B.17. Compliance Schedule for Copper at Outfall 004+005 and enterococci at 001, 002 and 004/005. Per 93-015/00-2011, if the permit action is a reissuance or a modification, and a water quality based limit is incorporated into the permit for the first time, then a schedule of compliance for meeting the new limit may be incorporated into the permit.
- B.18. Oil Storage Ground water Monitoring Reopener. Most facilities with large oil storage tanks, above or below ground, are required to monitor ground water under the Oil Discharge Contingency Plans and Administrative Fees for Approval Regulation, 9 VAC-25-90-10 et seq. Where potential exists for ground water pollution and that regulation does not require monitoring, the VPDES permit may under Code of Virginia section 62.1-44.21.
- B.19. Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened as necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.
- C.1. Toxics Management Program (Attachment 8). VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. Outfall 001: This condition

is required based on the Applicability Criteria of the Toxics Management Regulation. The daily maximum wastewater flow from these outfalls is greater than 50,000 gallons per day and a reasonable potential for toxicity exists in the wastewater as this outfall contains contact cooling water, which comes in contact with the dryer scrubbers. A diffuser was installed in the summer of 2002 (Attachment 9), and the NOEC has been adjusted in accordance with the increased mixing characteristics provided. Outfall 002 (treated wastewater from lagoon) has completed a Toxicity Reduction Evaluation (TRE) in a previous permit cycle, and a Whole Effluent Toxicity (WET) limit has been applied in accordance with the recommendation made September 10, 1997 by Mason Harper. A diffuser was installed in June 2000 (Attachment 10), and the NOEC has been adjusted in accordance with the increased mixing characteristics provided. Outfall 003, the barge discharge, has not been used since prior to 1989; however, because the treated wastewater has been shown to be potentially toxic, the untreated wastewater barged out to the Bay may also be potentially toxic, a requirement for TMP testing to begin has been included should this outfall be used. The NOEC for 003 has been adjusted in accordance with the mixing characteristics calculated by OWPS. It has been demonstrated through quarterly testing over the 1992-1997 permit term that Outfall 004 (Non-contact cooling water) is not acutely or chronically toxic, so TMP requirements were dropped for this outfall in the permit reissued December 17, 1997. However, a new configuration of 004/005 must be tested in accordance with DEQ TMP guidance and established as non-toxic.

Part II Conditions Applicable to all Permits. VPDES Permit Regulation, 9VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

20. NPDES Permit Rating Work Sheet: Total Score: 150 (Major) See Attachment 11.

21. Table II is to be used to record changes in the permit (1) from the previously issued permit and/or (2) during the permit processing period.

006 is now separated into 001 and 004/005 outfalls.

* Schedule of Compliance Applies

Table II Permit Processing Change Sheet – Limitation and Monitoring Requirements					
Limit/Monitoring	Parameter Changed	Requirement Changed From	Requirement Changed To	Rationale	Initials and Date
001	BOD	1755 kg/d mo avg 3142 kg/d max	1700 kg/d mo avg 3100 kg/d max	3/6/03 draft new guidance for two sig. figs- rounding down to remain under WLA	4/03 DMM
	TSS	655 kg/d mo avg 1609 kg/d max	650 kg/d mo avg. 1600 kg/d max	3/6/03 draft new guidance for two sig. figs- rounding down to remain under WLA	4/03 DMM
	Oil and Grease	372 mo avg 685 kg/d max	370 mo avg 680 kg/d max	3/6/03 draft new guidance for two sig. figs- rounding down to remain under WLA	4/03 DMM
	Total Phosphorus	37.85 kg/d	22.99 kg/d, rounded to 23	Flow decrease at the outfall	2/03 DMM

	loading				
	Ammonia-Nitrogen	1.68 mg/l avg/2.1 mg/l max	NL for both	Omega installed diffuser, calculations show no limit necessary	2/03 DMM
	Cyanide	1.54 ug/l avg/2.00 ug/l max	96 ug/l avg/110 max	Omega installed diffuser, calculations indicate higher limit appropriate.	2/03 DMM
	Dissolved Silver	No monitoring	NL	Application data suggest a potential problem, but calculations indicate no limit appropriate	2/03 DMM
	enterococci*	No monitoring	35/100 ml	appl. data show elevated levels of fecal coliform, discharge to shellfish waters	4/03 DMM
	Chlorine produced oxidant	No monitoring	580 ug/l avg/1200 ug/l max	Use of chlorine to react with cyanide-subject to plan and schedule	2/03 DMM
002	BOD	468 kg/d avg/837 kg/d max	270 kg/d avg/480 kg/d max	Reapportionment of wasteload allocation in accordance with application data, rounded down to 2 sig. figs.	2/03 DMM
	TSS	171 kg/d avg/422 kg/d max	160 kg/d avg/410 kg/d max	Reapportionment of wasteload allocation in accordance with application data, rounded down to 2 sig figs.	2/03 DMM
	Oil and Grease	27.6 kg/d avg/50.9 kg/d max	25 kg/d avg/46 kg/d max	Reapportionment of wasteload allocation in accordance with application data, rounded down	2/03 DMM

	enterococci*	No monitoring	35/100 ml	to 2 sig figs appl. data show elevated levels of fecal coliform, discharge to shellfish waters	
	WET limit	LC50 greater or equal to 100%	LC 50 greater or equal to 7%, TUa of 14	WET limit had not been adjusted for diffuser in last permit mod.	2/03 DMM
003	BOD	4296 kg/d mo avg 7710 kg/d max	4300 kg/d mo avg 7700 kg/d max	3/6/03 draft new guidance for two sig. figs-rounding down to remain under WLA	4/03 DMM
	TSS	114 kg/d mo avg 282 kg/d max	110 kg/d mo avg 280 kg/d max	3/6/03 draft new guidance for two sig. figs-rounding down to remain under WLA	4/03 DMM
	Oil and Grease	426 kg/d mo avg 784 kg/d max	430 kg/d mo avg 780 kg/d max	3/6/03 draft new guidance for two sig. figs-rounding down to remain under WLA	4/03 DMM
	Ammonia-Nitrogen	39.6 mg/l avg/49.0 max	36 mg/l avg/44 max	Ammonia criteria calculation justified decreasing limit slightly, rounded to 2 sig. fig.	2/03 DMM
	Dissolved Copper	No monitoring	NL	Total recoverable data presented indicated this parameter may be a problem, need dissolved data for eval. If there's a discharge	2/03 DMM
	Acceptable TMP criteria	LC50 > or equal to 100%	LC50> or equal to 25%	Criteria had not been adjusted for diffusion of barge movement in	2/03 DMM

				last permit mod	
004/005	Total Phosphorus loading	93.9 kg/d	53.7, rounded to 54 kg/d	Flow decrease at the outfall, 2 sig.fig	2/03 DMM
	enterococci	No monitoring	35/100 ml	appl. data show elevated levels of fecal coliform, discharge to shellfish waters	4/03 DMM
	Total Recoverable Copper*	No limit or monitoring	10 ug/l avg/12 ug/l max	Dissolved copper data presented indicated a limit is appropriate	2/03 DMM

Special Conditions: (List any changes associated with the special conditions and the reasons for the changes).

Former Condition 4. Industrial Reopener. Deleted per VPDES permit manual, iss. 4/01.

Condition 1 Compliance reporting and Quantification Levels. Required by updated Quantification Level guidance (00-2011 amendment #3) dated October 29, 2001.

Condition 4 Receiving Stream Monitoring and reopener. Due to ammonia criteria for Cockrell's Creek being calculated with less than the entire period of record of data (last 10 years), the monitoring ensures that DEQ can monitor the data for water quality standards violations.

Condition 5 Additional Guidance for Alternate Bacterial Disinfection. Added per Guidance memo 03-2007 and adapted for this industrial facility.

Condition 9 O&M manual. Updated per VPDES permit manual, iss. 4/01.

Condition 10 Licensed Wastewater operator. Updated per VPDES permit manual, iss. 4/01.

Condition 11 Submittal of Form 2C Section V and VI for Outfall 003 to complete the application. Outfall 003 has not been used in 15 years, and data provided on the application were estimates. Should the outfall be used, application sampling must take place with the data submitted to DEQ.

Condition 12 Lagoon Salinity Profile. A salinity profile of the lagoon will be helpful to assess if the lagoon still contains salty water from the gasket failure on the condensate plate heat exchangers.

Condition 13 Chlorine Limit at 001. Omega will be installing facilities to remove cyanide, using chlorine in accordance with the 2003 consent order being negotiated now. This condition establishes a chlorine limit that will become effective upon approval of a plan and schedule by DEQ.

Condition 14 Best Management Practices. Updated per VPDES permit manual, iss. 4/01.

Condition 15 Soil, Sediment and Water Column Sampling of Boat Maintenance Areas. To demonstrate if past practices are causing present water quality problems.

Condition 16 Water Quality Standards Monitoring. Updated per VPDES permit manual, iss. 4/01, and Site Specific Target Values Updated per mstranti spreadsheets for latest water quality values.

Condition 17 Compliance Schedule for Total Recoverable Copper 004/005 and enterococci at 001, 002 and 004/005. This is new to address need for water quality limits at these outfalls.

Condition 18. Oil Storage Groundwater Monitoring Reopener. New per VPDES permit manual, iss. 4/01.

Condition 19. 303(d) Reopener. Updated per VPDES permit manual, iss. 4/01.

Section C1. Toxics Management Program. Sections C.1.b. and C.1.c. (and I.A.7) have been updated in accordance with the tests run by the company since the previous permit reissuance, new outfall diffuser coefficients for 001, 002 and 003, and the current toxics management guidance (1993 manual, with revisions 2002). Sampling frequencies have been revised upward for 001 (from annual to quarterly) due to the number of invalid tests presented for review during the past permit cycle, and because 001 is now separate from the non-contact cooling water (004/005). Quarterly testing at 004/005 is required in accordance with 1993 toxics guidance, in which any new changes to the waste stream require testing.

Table III
NUMBER AND DESCRIPTION OF DISCHARGES
(Complete this item or attach page one of Form 2C)

OUTFALL NUMBER AND LOCATION	SOURCE OF DISCHARGE (LIST OPERATION CONTRIBUTING FLOW)	TREATMENT (BRIEF DESCRIPTION UNIT BY UNIT)	FLOW AVERAGE/MAXIMUM (GIVE AVG & MAX FOR INDUSTRY & DESIGN FOR MUNICIPAL)
001 Cockrell's Creek	Processing Menhaden: Contact Cooling water from Dryer Scrubbers; Emergency Discharge of Evaporation Condensate	Evaporation	4.14 MGD max daily flow; 3.82 MGD max. 30-day flow, 3.04 MGD long term average flow
002 Cockrell's Creek	Processing Menhaden: the aerated lagoon treatment of the condensate.	Aeration, detention	0.481 MGD max daily flow, 0.249 MGD max. 30-day flow, 0.210 MGD long term average flow
003 Chesapeake Bay	Processing Menhaden: Evaporation Condensate.	Evaporation	0.4 MGD long term avg. flow, 0.4 MGD max (measured in barge-fuls of condensate, at 0.2 MGD per barge)
004/005 Cockrell's Creek	Processing Menhaden: Non-contact Cooling water from Evaporation Units	Evaporation	14.2 MGD max daily flow, 7.1MGD max. 30-day flow, 5.64 MGD long term average flow
East of Fleeton Point Light and Black Can Buoy #3	refrigeration water (from ships)	None	unknown: subject to criteria that the discharge be made while the ship is underway and at a rate such that the discharge is not visible.
Stormwater handled by General Permit	Stormwater Monitoring at Outfall 001	None	Unknown at this time: monitored under general permit

Bailwater is creekwater used to transfer the fish off the boat hydraulically to shore at the dock. The bailwater goes through the process so what water is not evaporated is discharged through outfall 001.

The boat engines require cooling water and a discharge of the engine cooling water may be seen at the dock if the engines are running waiting to unload the fish catch.

Stickwater is wastewater from the fish cooker that has been pressed and centrifuged. It consists of 10 percent solids. It is further evaporated to condensate, which is 50 percent solids. The condensate is treated with the aerated lagoon and discharged to Cockrell's Creek at outfall 002 or may be barged to 003 (though the 003 outfall has not been used in over 15 years).

Omega Protein Calculation of Conventional Limits (sirkethrough from 1997 modification and present reissuance)

Table IV

Production (from 2C Application) 3,200,000 2,400,000 Kg: Calculation of Technology Limits for 001, 002, 003

*Long Term Average Loadings Used from 2C application.			Scrubber 001 6 3.037MGD 608 160 kg/d BOD Long Term Avg 446 199 kg/d TSS, 404 kg/d O&G		Lagoon 002 0.28 0.25 MGD 486 22.2 kg/d BOD Long Term Avg 408 50.8 kg/d TSS, 7.6 3.6 kg/d O&G		Barge 003 0.3 0.4 MGD 464 kg/d BOD Long Term Avg 12.8 kg/d TSS, 23.1 kg/d O&G (no changes other than flow)	
	Multiplier K/KKG	Total Kg/D = (Production x multiplier/1000)		Kg/D total x (proportion 001 loading/total loading)		Kg/D total x (proportion 002 loading/total loading)		Kg/D total x (proportion 003 loading/total loading)
BOD ₅	Avg 3.9	42480 9360	001 BOD Loading/Total Loading = 608/4348 = 0.1478 160/646.2 = 0.2476	42480 x .5178 = 6462 9360 x .2476 = 2317.536 Kg/d	002 BOD Loading/Total Loading = 486/4348 = 0.1380 22.2/646.2 = 0.0344	4722 Kg/d 9360 x .0344 = 321.984	003 BOD Loading/Total Loading = 464/4348 = 0.1067 12.8/23.1 = 0.5541	4266 Kg/d 9360 x .7180 = 6720.89 use 4296 rounded to 4300
Total BOD Loading* = 608 + 160 + 464 = 1232 kg/d 160 + 22.2 + 464 = 646.2 kg/d	Max 7.0	22400 16800		22400 x .5178 = 11600 16800 x .2476 = 4159.68		3094 16800 x .0344 = 577.92		7740 16800 x .7180 = 12062.4 use 7710 rounded to 7700
TSS	Avg 1.5	4800 3600	001 TSS Loading/Total Loading = 0.7735 199/262.6 = 0.7578	3743 3600 x .7578 = 2728.08	002 TSS Loading/Total Loading = 0.2027 50.8/262.6 = .1935	973 3600 x .1935 = 696.4	003 TSS Loading/Total Loading = 0.0238 12.8/262.6 = .0487	444 3600 x .0487 = 175.476 use 114 rounded to 110
Total TSS Loading* = 446 + 109 + 12.8 = 568 199 + 50.8 + 12.8 = 262.6 kg/d	Max 3.7	11,840 8880		9468 8880 x .7578 = 6729.264		2400 8880 x .1935 = 1718.28		282 8880 x .0487 = 432.456 use 282 rounded to 280
O&G	Avg 0.76	2432 1824	001 O&G Loading/Total Loading = 0.7682 54.3/81 = 0.6704	4868 1824 x .6704 = 1222.7549	002 O&G Loading/Total Loading = 0.0568 3.6/81 = .0444	438 1824 x .0444 = 81.0667	003 O&G Loading/Total Loading = 0.4760 23.1/81 = 0.2852	426 1824 x .2852 = 520.1778 use 426 rounded to 430
Total O&G Loading* = 404 + 7.6 + 23.1 = 432 54.3 + 3.6 + 23.1 = 81 Kg/d	Max 1.4	4480 3360		3442 3360 x .6704 = 2252.4444		264 3360 x .0444 = 149.3333		784 3360 x .2852 = 958.2222 use 784 rounded to 780

HOWEVER, WQS DICTATE TOTAL ALLOWABLE BOD DISCHARGE TO CREEK IS 4900 LB/DAY AFTER THE WLA FOR THE REEDVILLE WWTP HAS BEEN SUBTRACTED. FRED CUNNINGHAM'S FACT SHEET DATED 8/29/84 ALLOWED A TOTAL OF 2223 KG/D. THIS HAS BEEN ALLOCATED IN ITS ENTIRETY TO OMEGA PROTEIN WITH THE 1997 PERMIT MODIFICATION.

THEREFORE THE SUM OF BOD FOR 001 AND 002, THE TWO PROCESS OUTFALLS DISCHARGING TO CREEK, CANNOT EXCEED 2223 KG/D, AND WQS LIMITS APPLY TO THESE 2 OUTFALLS. 003 IS LIMITED BY TECHNOLOGY LIMITS.

		Kg/d Total Wasteload Allocation 001+002 (from previous permit)	Scrubber 001 6 3.037 MGD	Lagoon 002 0.20 0.25 MGD
BODs	Avg	2223	001 BOD Loading/Total Loading = $\frac{2223 \times .7806}{160/182.2} = 0.8782$	002 BOD Loading/Total Loading = $\frac{468}{22.2/182.2} = 0.2404$
			$2223 \times .7806 = 1755$ <i>rounded to 1700</i> Kg/d	$2223 \times .1218 = 270.76$ use 271 Kg/d <i>rounded to 270</i>
Total BOD Loading* = 600 + 186 = 804 160 + 22.2 = 182.2 kg/d	Max	3979	$2070 \times .7806 = 3442$ $3979 \times .8782 = 3494.38$ <i>use 3142</i> <i>rounded to 3100</i>	$3989 \times .1218 = 485.86$ use 486 <i>rounded to 480</i>
TSS	Avg	826	001 TSS Loading/Total Loading = $\frac{826 \times .7966}{199/249.8} = 0.7966$	002 TSS Loading/Total Loading = $\frac{474}{50.8/249.8} = 0.2076$
			$826 \times .7966 = 657.99$ use 655 <i>rounded to 650</i>	$826 \times .2034 = 168$ use 168 <i>rounded to 160</i>
Total TSS Loading* = 446 + 100 = 526 199 + 50.8 = 249.8 kg/d	Max	2031	4600 $2031 \times .7966 = 1617.89$ <i>use 1609</i> <i>rounded to 1600</i>	422 $2031 \times .2034 = 413.11$ use 413 <i>rounded to 410</i>
O&G	Avg	400	001 O&G Loading/Total Loading = $\frac{400 \times .9378}{54.3/57.9} = 0.9378$	002 O&G Loading/Total Loading = $\frac{27.6}{3.6/57.9} = 0.0622$
			$400 \times .9378 = 375$ use 372 <i>rounded to 370</i>	$400 \times .0622 = 24.88$ use 24.9 <i>rounded to 25</i>
Total O&G Loading* = 404 + 7.5 = 408.5 54.3 + 3.6 = 57.9 Kg/d	Max	736	685 $736 \times .9378 = 690$ use 685 <i>rounded to 680</i>	50.9 $736 \times .0622 = 45.78$ use 45.8 <i>rounded to 46</i>

Table V

EVALUATION OF EFFLUENT CHARACTERIZATION DATA 001 outfall
 Receiving Stream: Hardness: NA (Saltwater Limits apply)
 Flow: 3.82 MGD

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Data from 2C application/Attachment D evaluated and all units ug/l, unless otherwise specified *Measured as Dissolved species
Acute (WLA _a)	Chronic (WLA _c)					
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Antimony	<5	4300 (Human Health standard)			460000 Human Health WLA	Value is below detection
Aldrin	<0.5, <0.05	1.3	0.13	150	22	All data below QL of 0.5
Ammonia	17.1, 33.1,13.2,21. 3, 0.99,0.99,8.8, 14.4,6.16,12, 47,15.4,7.28, 4.76,3.07, 2.38,4.86, 17.7, 7.56, 13.4,11.8, 7, 14.8, mg/l	1.4	0.21	150	22	No limit indicated after evaluation
Arsenic-trivalent, inorganic	<50	69*	36*	7400	3900	All data below lab QL of 50
Cadmium	8	43*	9.3*	4600	1000	No limit indicated after evaluation
Chlordane	<1, <0.2	0.009	0.004	9.6	0.43	Program indicates all data below QL, though <1 not less than DEQ

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
						required QL of 0.2—rerun 9/02 at 0.2 QL
Chlorpyrifos (Dursban)	<0.1	0.011	0.0056	1.2	0.60	Value below detection
Chromium-hexavalent	<10	1100*	50*	120000*	5400	Data below QL level
Chromium-trivalent	No data required		No Saltwater value			Limit not evaluated
Copper, Dissolved	68,53,59,62,6 6,68,74,48,41 ,88	5.9*	3.8*	630	410	No limit indicated after evaluation
Cyanide, Total	30,90,120,17 0,299,205,48, 14,59,5,<5,10 ,19,9,89,70,4 8,198,75,341, 170, 329, 2094, 2614, 1135, 263, <5	1.0	1.0	110	110	Mo. Avg limit of 95.9 ug/l, Max Daily limit of 110 ug/l determined
DDD	<0.15, <0.1		0.0083 Human Health Standard		0.90 human health WLA	Value is less than detection— however, specified QL is 0.1; sample retested 9/02 at QL 0.1 ug/l
DDE	<0.05, <0.05		0.0059 Human Health Standard		0.63 human health WLA	Value is less than detection
				14	0.11	Value is less than detection—

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
DDT	<0.15, <0.1	0.13	0.001			however, specified QL is 0.1. sample retested 9/02 at QL 0.1
Demeton	<2		0.1		11	Value is less than detection
Dieldrin	<0.05, <0.05	0.71	0.0019	76	0.20	Value is less than detection
Endosulfan	<0.15, <0.05	0.034	0.0087	3.6	0.93	Value is less than detection— however, specified QL is 0.1. Sample retested 9/02 at QL 0.05
Endrin	<0.15, <0.1	0.037	0.0023	4.0	0.25	Value is less than detection— however, specified QL is 0.1. Sample retested 9/02 at QL 0.1.
Guthion	<20 mg/l		0.01		1.1	Value is less than detection
Heptachlor	<0.05, <0.05	0.053	0.0036	5.7	0.39	Value is less than detection
Hydrogen Sulfide	2.5 mg/l		2.0		210	No limit indicated after evaluation
Iron	Total Iron believed absent		No Saltwater Value			Limit not evaluated
Kepone	<2 ug/l		0			Value is less than detection
Lead	<1	240	9.3	26000	1000	Value is less than detection
Lindane (Hexa- chlorocyclohexane)	<0.04	0.16	0.01	17	1.1	Value is less than detection
					11	Value is less than detection

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PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Malathion	<2 ug/l		0.1			
Manganese	89		50		5350	No limit indicated after evaluation
Mercury	<0.2	2.1 *	0.025 *	220	2.7	Value is less than detection
Methoxychlor	<0.4 ug/l, <2		0.03		3.2	Value is less than detection
Mirex	<0.1		0			Value is less than detection
Nickel	<5	75*	8.3*	8000	890	Value less than detection
PCB-1016	<1 mg/l, <1 ug/l		0.03		3.2	Value less than detection however, specified QL is 1 ug/l/ Test repeated 9/02
PCB-1221	<1 mg/l, <1 ug/l		0.03		3.2	Value less than detection however, specified QL is 1 ug/l/ Test repeated 9/02
PCB-1232	<1 mg/l, <1 ug/l		0.03		3.2	Value less than detection however, specified QL is 1 ug/l/ Test repeated 9/02
PCB-1242	<1 mg/l, <1 ug/l		0.03		3.2	Value less than detection However, specified QL is 1ug/l/ Test repeated 9/02
PCB-1248	<1 mg/l, <1 ug/l		0.03		3.2	Value less than detection however, specified QL is 1 ug/l/ Test repeated 9/02
PCB-1254	<1 mg/l, <1 ug/l		0.03		3.2	Value less than detection however, specified QL is 1 ug/l/ Test repeated 9/02
PCB-1260	<1 mg/l, <1 ug/l		0.03		3.2	Value less than detection however, specified QL is 1 ug/l/ Test repeated 9/02
Phenol	<10		4600000 Human Health Standard		490,000, 000	Value less than detection

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cornix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Phthalate Esters	Believed absent		3.0			Limit not evaluated
Selenium	<5	300*	71*	32000	7600	Value is less than detection.
Silver	3.2,2.68,3.17, 2.69,2.41,2.0 7,2.77,2.95, 27, 6.23	2.3*		250		No limit indicated after evaluation
Toxaphene	<1, <1	0.21	0.0002	22	0.021	Value less than detection
2-(2,4,5-Trichlorophenoxy) Propionic Acid (Silvex)	<0.002		50		5350	Value less than detection
Tributyltin	<0.5	0.36	0.001	39	0.11	Value less than detection
Zinc	<20	95*	86*	10000	9200	Value is less than detection.
Base Neutral Extractables						
Acenaphthene	<10		2700 Human Health Std		290000 Human Health WLA	Value is less than detection
Anthracene	<10		110000 Human Health Std		1200000 0 Human Health WLA	Value is less than detection
Benzo(a)anthracene	<10		0.49 Human Health Std		52 Human Health WLA	Value is less than detection
Benzo(b)fluoranthene	<10		0.49 Human Health Std		52 Human	Value is less than detection

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PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
				Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l		
					Health WLA	
Benzo(k)fluoranthene	<10		0.49 Human Health Std		52 Human Health WLA	Value is less than detection
Benzo(a)pyrene	<10		0.49 Human Health Std		52 Human Health WLA	Value is less than detection
Butyl Benzyl phthalate	<10		5200 Human Health Std		560000 Human Health WLA	Value is less than detection
Chrysene	<10		0.49 Human Health Std		52 Human Health WLA	Value is less than detection
Dibenz(a,h)anthracene	<10		0.49 Human Health Std		52 Human Health WLA	Value is less than detection
Dibutyl phthalate	<10		12000 Human Health Std		1300000 Human Health WLA	Value is less than detection
1, 2 Dichlorobenzene	<10		17000 Human Health Std		1800000	Value is less than detection

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Data from 2C application/Attachment D evaluated and all units ug/l, unless otherwise specified *Measured as Dissolved species
Acute (WLA _a)	Chronic (WLA _c)					
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					Human Health WLA	
1, 3 Dichlorobenzene	<10		2600 Human Health Std		280000 Human Health WLA	Value is less than detection
1, 4 Dichlorobenzene	<10		2600 Human Health Std		280000 Human Health WLA	Value is less than detection
Diethylphthalate	<10		120000 Human Health Std		1300000 0 Human Health WLA	Value is less than detection
Di-2-ethylhexylphthalate	<10		59 Human Health Std		6300 Human Health WLA	Value is less than detection
2,4-Dinitrotoluene	<10		91 Human Health Std		9700 Human Health WLA	Value is less than detection
Fluoranthene	<10		370 Human Health Std		40000 Human Health WLA	Value is less than detection
Fluorene	<10		14000 Human Health Std		1500000	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
				*Measured as Dissolved species		
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					Human Health WLA	
Ideno(1,2,3-cd)pyrene	<10		0.49 Human Health Std		52 Human Health WLA	Value is less than detection
Isophorone	<10		490000 Human Health Std.		52000 000 Human Health WLA	Value is less than detection
Pyrene	<10		11000 Human Health Std		1200000 Human Health WLA	Value is less than detection
1,2,4-Trichlorobenzene	<10		950 Human Health Std		100000 Human Health WLA	Value is less than detection
Volatiles						
Benzene	<5		710 Human Health Std		76000 Human Health WLA	Value is less than detection
Bromoform	<5		3600 Human Health Std		390000 Human Health	Value is less than detection

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					WLA	
Carbon Tetrachloride	<5		45 Human Health Std		4800 Human Health Std	Value is less than detection
Chlorodibromomethane	<5		57000 Human Health Std		6100000 Human Health WLA	Value is less than detection
Chloroform	<5		4700 Human Health Std		500000 Human Health WLA	Value is less than detection
Dichloromethane	<5		16000 Human Health Std		1700000 Human Health WLA	Value is less than detection
Dichlorobromomethane	<5		460 Human Health Std		49000 Human Health WLA	Value is less than detection
1, 2-Dichloroethane	<5		990 Human Health Std		110000 Human Health WLA	Value is less than detection
1,1-Dichloroethylene	<5		17000 Human Health Std		1800000 Human Health	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALTWATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Multiplier of 107 determined by Dale Phillips with Cormix model.		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					WLA	
Ethylbenzene	<5		29000 Human Health Std		3100000 Human Health WLA	Value is less than detection
Tetrachloroethylene	<5		3500 Human Health Std		370000 Human Health Std	Value is less than detection
Vinyl Chloride	<10		5300 Human Health Std		570000 Human Health Std	Value is less than detection
Acids Extractables						
2-Chlorophenol	<10		400 Human Health Std		43000 Human Health WLA	Value is less than detection
2,4-Dichlorophenol	<10		790 Human Health Std		85000 Human Health WLA	Value is less than detection
2,4-Dimethylphenol	<10		2300 Human Health Std		250000 Human Health WLA	Value is less than detection
Pentachlorophenol	<50	13	7.9	1400	850	Value is less than detection
2,4,6-Trichlorophenol	<10		65 Human Health Std		7000	Value is less than detection

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[illegible]

EVALUATION OF EFFLUENT CHARACTERIZATION DATA

Receiving Stream: Cockrell's Creek

Hardness: NA (Saltwater Limits apply)

Flow: 0.25 MGD

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Antimony	<5	4300 (Human Health standard)			430000 Human Health WLA	Value is below detection
Aldrin	<0.5,<0.05	1.3	0.13	130	13	All data below QL of 0.5
Ammonia, mg/l	48.3,45.4,48.2,53.2,48.5,45.9,25.2,13.4,11.8,35.3,29.4,19.6,16.5,8.4,8.4,6.44,14	1.4	0.21	140	21	Limits determined: 39.1 avg mo. limit, 49.0 max daily limit. These exceed limit determined in previous permit, revert to old limits: 38.0 mo. avg., 45.3 max daily limit.
Arsenic-trivalent, inorganic	<50	69*	36*	7000	3600	All data below lab QL of 50
Cadmium	<1	43*	9.3*	4300	940	All data below detection
Chlordane	<1, <0.20	0.009	0.004	9.1	0.4	Program indicates all data below QL, though <1 not less than DEQ required QL of 0.2. Retested 9/02 at 0.2 QL.
Chlorpyrifos (Dursban)	<0.1	0.011	0.0056	1.1	0.57	Value below detection
Chromium-hexavalent	<10	1100*	50*	110000	5100	Data below QL level

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PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Chromium-trivalent	No data required		No Saltwater value			Limit not evaluated
Copper, Dissolved	8	2.9*	2.9*	600	380	No limit indicated after evaluation
Cyanide, Total	<10, <10, <10	1.0	1.0	26	2.6	No limit indicated after evaluation
DDD	<0.15		0.0083 Human Health Standard		0.85 human health WLA	Value is less than detection— however, specified QL is 0.1
DDE	<0.05		0.0059 Human Health Standard		0.60 human health WLA	Value is less than detection
DDT	<0.15, <0.1	0.13	0.001	13	0.1	Value is less than detection— however, specified QL is 0.1. Retested 9/02 at 0.1 QL.
Demeton	<2		0.1		10	Value is less than detection
Dieldrin	<0.05, <0.05	0.71	0.0019	72	0.19	Value is less than detection
Endosulfan	<0.15, <0.05	0.034	0.0087	34	0.88	Value is less than detection— however, specified QL is 0.1. Retested 9/02 at 0.1 QL.
Endrin	<0.15, <0.10	0.037	0.0023	37	0.23	Value is less than detection— however, specified QL is 0.1. Retested 9/02 at 0.1 QL.

bpc

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Guthion	<20 mg/l		0.01		1	Value is less than detection
Heptachlor	<0.05, <0.05 <1 mg/l	0.053	0.0036	5.4	0.36	Value is less than detection
Hydrogen Sulfide			2.0		200	Value is less than detection
Iron	Total Iron believed absent		No Saltwater Value			Limit not evaluated
Kepone	<2 ug/l		0			Value is less than detection
Lead	<1	240	9.3	24000	940	Value is less than detection
Lindane (Hexa- chlorocyclohexane)	<0.04	0.16	0.01	16	1	Value is less than detection
Malathion	<2 ug/l		0.1		10	Value is less than detection
Manganese	8		50		5050	No limit indicated after evaluation
Mercury	<0.2	2.1 *	0.025 *	210	2.5	Value is less than detection
Methoxychlor	<0.4, 2 ug/l		0.03		3	Value is less than detection
Mirex	<0.1		0			Value is less than detection
Nickel	<5	75*	8.3*	7600	840	Value less than detection
PCB-1016	<1 mg/l, <1 ug/l		0.03		3	Value less than detection however, specified QL is 1 ug/l. Retested 9/02 at 1 ug/l QL.
PCB-1221	<1 mg/l, <1 ug/l		0.03		3	Value less than detection however, specified QL is 1 ug/l Retested 9/02 at 1 ug/l QL.

9.300

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
PCB-1232	<1 mg/l, <1 ug/l		0.03		3	Value less than detection however, specified QL is 1 ug/l Retested 9/02 at 1 ug/l QL.
PCB-1242	<1 mg/l, <1 ug/l		0.03		3	Value less than detection however, specified QL is 1ug/l Retested 9/02 at 1 ug/l QL.
PCB-1248	<1 mg/l, <1 ug/l		0.03		3	Value less than detection however, specified QL is 1 ug/l Retested 9/02 at 1 ug/l QL.
PCB-1254	<1 mg/l, <1 ug/l		0.03		3	Value less than detection however, specified QL is 1 ug/l Retested 9/02 at 1 ug/l QL.
PCB-1260	<1 mg/l, <1 ug/l		0.03		3	Value less than detection however, specified QL is 1 ug/l Retested 9/02 at 1 ug/l QL.
Phenol	<10		4,600,000 Human Health Standard		460,000, 000	Value less than detection
Phthalate Esters	believed absent		3.0			Limit not evaluated
Selenium	<5	300*	71*	30000	7200	Value is less than detection.
Silver	<1	2.3 *		230		Value is less than detection
Toxaphene	<1, <1	0.21	0.0002	21	0.02	Value less than detection
2-(2,4,5-Trichlorophenoxy) Propionic Acid (Silvex)	<0.002		50		5050	Value less than detection
Tributyltin	<0.5	0.36	0.001	36	0.1	Value less than detection
Zinc	<20	95*	86*	9600	8700	Value is less than detection.
Base Neutral Extractables						

10.51

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l Value is less than detection
Acenaphthene	<10		2700 Human Health Std		270000 Human Health WLA	
Anthracene	<10		110000 Human Health Std		11,000,0 00 Human Health WLA	Value is less than detection
Benzo(a)anthracene	<10		0.49 Human Health Std		49 Human Health WLA	Value is less than detection
Benzo(b)fluoranthene	<10		0.49 Human Health Std		49 Human Health WLA	Value is less than detection
Benzo(k)fluoranthene	<10		0.49 Human Health Std		49 Human Health WLA	Value is less than detection
Benzo(a)pyrene	<10		0.49 Human Health Std		4.9 Human Health WLA	Value is less than detection
Butyl Benzyl phthalate	<10		5200 Human Health Std		530000 Human Health WLA	Value is less than detection

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Chrysene	<10		0.49 Human Health Std		49 Human Health WLA	Value is less than detection
Dibenz(a,h)anthracene	<10		0.49 Human Health Std		49 Human Health WLA	Value is less than detection
Dibutyl phthalate	<10		12000 Human Health Std		1200000 Human Health WLA	Value is less than detection
1, 2 Dichlorobenzene	<10		17000 Human Health Std		1700000 Human Health WLA	Value is less than detection
1, 3 Dichlorobenzene	<10		2600 Human Health Std		260000 Human Health WLA	Value is less than detection
1, 4 Dichlorobenzene	<10		2600 Human Health Std		260000 Human Health WLA	Value is less than detection
Diethylphthalate	<10		120000 Human Health Std		12,000,0 00 Human Health	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					WLA	
Di-2-ethylhexylphthalate	<10		59 Human Health Std		6000 Human Health WLA	Value is less than detection
2,4-Dinitrotoluene	<10		91 Human Health Std		9200 Human Health WLA	Value is less than detection
Fluoranthene	<10		370 Human Health Std		37000 Human Health WLA	Value is less than detection
Fluorene	<10		14000 Human Health Std		1400000 Human Health WLA	Value is less than detection
Ideno(1,2,3-cd)pyrene	<10		0.49 Human Health Std		49 Human Health WLA	Value is less than detection
Isophorone	<10		490000 Human Health Std.		49,000 ,000 Human Health WLA	Value is less than detection
Pyrene	<10		11000 Human Health Std		1100000 Human	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
				*Measured as Dissolved species		
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					Health WLA	
1,2,4-Trichlorobenzene	<10		950 Human Health Std		96000 Human Health WLA	Value is less than detection
Volatiles						
Benzene	<5		710 Human Health Std		72000 Human Health WLA	Value is less than detection
Bromoform	<5		3600 Human Health Std		360000 Human Health WLA	Value is less than detection
Carbon Tetrachloride	<5		45 Human Health Std		45000 Human Health Std	Value is less than detection
Chlorodibromomethane	<5		57000 Human Health Std		5,800,00 0 Human Health WLA	Value is less than detection
Chloroform	<5		4700 Human Health Std		470000 Human Health WLA	Value is less than detection
Dichloromethane	<5		16000 Human Health Std		1,600,00 0 Human	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					Health WLA	
Dichlorobromomethane	<5		460 Human Health Std		46000 Human Health WLA	Value is less than detection
1, 2-Dichloroethane	<5		990 Human Health Std		100,000 Human Health WLA	Value is less than detection
1,1-Dichloroethylene	<5		17000 Human Health Std		1,700,00 0 Human Health WLA	Value is less than detection
Ethylbenzene	<5		29000 Human Health Std		2,900,00 0 Human Health WLA	Value is less than detection
Tetrachloroethylene	<5		3500 Human Health Std		350,000 Human Health Std	Value is less than detection
Vinyl Chloride	<10		5300 Human Health Std		540,000 Human Health Std	Value is less than detection
Acids Extractables						
2-Chlorophenol	<10		400 Human Health Std		40,000 Human	Value is less than detection

10.50'

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER Ug/l	Multiplier of 101 determined by JvS with Cormix model		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					Health WLA	
2,4-Dichlorophenol	<10		790 Human Health Std		80,000 Human Health WLA	Value is less than detection
2,4-Dimethylphenol	<10		2300 Human Health Std		230,000 Human Health WLA	Value is less than detection
Pentachlorophenol	<50	13	7.9	1300	800	Value is less than detection
2,4,6-Trichlorophenol	<10		65 Human Health Std		6600 Human Health WLA	Value is less than detection

AC.01

Table VII

EVALUATION OF EFFLUENT CHARACTERIZATION DATA 004/005 outfall—Omega called 006 in application

Receiving Stream: Hardness: NA (Saltwater Limits apply)

Flow: 7.1 MGD

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
				*Measured as Dissolved species		
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Antimony	<5	4300 (Human Health standard)			220000 Human Health WLA	Value is below detection
Aldrin	<0.5,<0.05	1.3	0.13	2.6	6.6	All data below QL of 0.5
Ammonia mg/l	0.309, 0.298, 0.281,0.296,0 .575,0.553, 3.7	1.4	0.21	2.8	11	No limit indicated after analysis.
Arsenic-trivalent, inorganic	<50	69*	36*	140	1800	All data below lab QL of 50
Cadmium	8	43*	9.3*	86	470	No limit indicated after evaluation
Chlordane	<1	0.009	0.004	0.18	0.2	Program indicates all data below QL, though <1 not less than DEQ required QL of 0.2
Chlorpyrifos (Dursban)	<0.1	0.011	0.0056	0.022	0.29	Value below detection
Chromium-hexavalent	<10	1100*	50*	2200*	2600	Data below QL level
Chromium-trivalent	No data required		No Saltwater value			Limit not evaluated
Copper, Dissolved	117, 36	2.9*	2.9*	12	190	Mo. Avg limit of 10.5 ug/l, Max Daily limit of 12 ug/l determined

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Cyanide, Total	<0.01	1.0	1.0	2	51	Value is less than detection
DDD	<0.15		0.0083 Human Health Standard		0.43 human health WLA	Value is less than detection— however, specified QL is 0.1
DDE	<0.05		0.0059 Human Health Standard		0.30 human health WLA	Value is less than detection
DDT	<0.15	0.13	0.001	0.26	0.051	Value is less than detection— however, specified QL is 0.1
Demeton	<2		0.1		5.1	Value is less than detection
Dieldrin	<0.05	0.71	0.0019	14	0.097	Value is less than detection
Endosulfan	<0.15, <0.05	0.034	0.0087	0.068	0.44	Value is less than detection— however, specified QL is 0.1. Retested 9/02 at QL 0.05.
Endrin	<0.15	0.037	0.0023	0.074	0.12	Value is less than detection— however, specified DL is 0.1
Guthion	<20 mg/l		0.01		0.51	Value is less than detection
Heptachlor	<0.05, <0.05	0.053	0.0036	0.11	0.18	Value is less than detection
Hydrogen Sulfide	2.5 mg/l		2.0		100	No limit indicated after evaluation
Iron	Total Iron believed		No Saltwater			Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
	absent		Value			
Kepone	<2 ug/l		0			Value is less than detection
Lead	<1	240	9.3	6200	240	Value is less than detection
Lindane (Hexa- chlorocyclohexane)	<0.04	0.16	0.01	0.048	0.047	Value is less than detection
Malathion	<2 ug/l		0.1		5.1	Value is less than detection
Manganese	98		50		2500	No limit indicated after evaluation
Mercury	<0.2	2.1 *	0.025 *	4.2	1.3	Value is less than detection
Methoxychlor	<0.4 ug/l		0.03		1.5	Value is less than detection
Mirex	<0.1		0			Value is less than detection
Nickel	14	75*	8.3*	150	420	No limit indicated after evaluation
PCB-1016	<1 mg/l		0.03		1.5	Value less than detection however, specified DL is 1 ug/l
PCB-1221	<1 mg/l		0.03		1.5	Value less than detection however, specified DL is 1 ug/l
PCB-1232	<1 mg/l		0.03		1.5	Value less than detection however, specified DL is 1 ug/l
PCB-1242	<1 mg/l		0.03		1.5	Value less than detection however, specified DL is 1ug/l
PCB-1248	<1 mg/l		0.03		1.5	Value less than detection however, specified DL is 1 ug/l
PCB-1254	<1 mg/l		0.03		1.5	Value less than detection however, specified DL is 1 ug/l
PCB-1260	<1 mg/l		0.03		1.5	Value less than detection however, specified DL is 1 ug/l

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Data from 2C application evaluated and all units ug/l, unless otherwise specified
Acute (WLA _a)	Chronic (WLA _c)	*Measured as Dissolved species				
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
Phenol	<10		4600000 Human Health Standard		230,000, 000	Value less than detection
Phthalate Esters	believed absent		3.0			Limit not evaluated
Selenium	<5	300*	71*	600	3600	Value is less than detection.
Silver	24, 4.72	2.3 *		4.6		Max daily limit of 4.6 ug/l and avg. mo. limit of 4.6 determined
Toxaphene	<1	0.21	0.0002	0.42	0.001	Value less than detection
2-(2,4,5-Trichlorophenoxy) Propionic Acid (Silvex)	<0.002		50		2500	Value less than detection
Tributyltin	<0.5	0.36	0.001	0.72	0.051	Value less than detection
Zinc	<20	95*	86*	190	4400	Value is less than detection.
Base Neutral Extractables						
Acenaphthene	<10		2700 Human Health Std		140,000 Human Health WLA	Value is less than detection
Anthracene	<10		110000 Human Health Std		5,600,00 0 Human Health WLA	Value is less than detection
Benzo(a)anthracene	<10		0.49 Human Health Std		25 Human Health WLA	Value is less than detection
Benzo(b)fluoranthene	<10		0.49 Human		25	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
			Health Std		Human Health WLA	
Benzo(k)fluoranthene	<10		0.49 Human Health Std		25 Human Health WLA	Value is less than detection
Benzo(a)pyrene	<10		0.49 Human Health Std		25 Human Health WLA	Value is less than detection
Butyl Benzyl phthalate	<10		5200 Human Health Std		270,000 Human Health WLA	Value is less than detection
Chrysene	<10		0.49 Human Health Std		25 Human Health WLA	Value is less than detection
Dibenz(a,h)anthracene	<10		0.49 Human Health Std		25 Human Health WLA	Value is less than detection
Dibutyl phthalate	<10		12000 Human Health Std		610,000 Human Health WLA	Value is less than detection
1, 2 Dichlorobenzene	<10		17000 Human Health Std		870,000 Human	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					Health WLA	
1, 3 Dichlorobenzene	<10		2600 Human Health Std		130,000 Human Health WLA	Value is less than detection
1, 4 Dichlorobenzene	<10		2600 Human Health Std		130,000 Human Health WLA	Value is less than detection
Diethylphthalate	<10		120000 Human Health Std		6,100,00 0 Human Health WLA	Value is less than detection
Di-2-ethylhexylphthalate	<10		59 Human Health Std		3000 Human Health WLA	Value is less than detection
2,4-Dinitrotoluene	<10		91 Human Health Std		2100 Human Health WLA	Value is less than detection
Fluoranthene	<10		370 Human Health Std		19,000 Human Health WLA	Value is less than detection
Fluorene	<10		14000 Human Health Std		710,000 Human Health	Value is less than detection

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
				Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l		
					WLA	
Ideno(1,2,3-cd)pyrene	<10		0.49 Human Health Std		25 Human Health WLA	Value is less than detection
Isophorone	<10		490000 Human Health Std.		25,000 ,000 Human Health WLA	Value is less than detection
Pyrene	<10		11000 Human Health Std		560,000 Human Health WLA	Value is less than detection
1,2,4-Trichlorobenzene	<10		950 Human Health Std		48,000 Human Health WLA	Value is less than detection
Volatiles						
Benzene	<5		710 Human Health Std		36,000 Human Health WLA	Value is less than detection
Bromoform	<5		3600 Human Health Std		180,000 Human Health WLA	Value is less than detection
Carbon Tetrachloride	<5		45 Human Health Std		2300 Human Health	Value is less than detection

PARAMETER	EFFLUENT CONCEN- TRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Data from 2C application evaluated and all units ug/l, unless otherwise specified *Measured as Dissolved species
Acute (WLA _a)	Chronic (WLA _c)					
						Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l
					Std	
Chlorodibromomethane	<5		57000 Human Health Std		2,900,000 Human Health WLA	Value is less than detection
Chloroform	<5		4700 Human Health Std		240,000 Human Health WLA	Value is less than detection
Dichloromethane	<5		16000 Human Health Std		820,000 Human Health WLA	Value is less than detection
Dichlorobromomethane	<5		460 Human Health Std		23,000 Human Health WLA	Value is less than detection
1, 2-Dichloroethane	<5		990 Human Health Std		50,000 Human Health WLA	Value is less than detection
1,1-Dichloroethylene	<5		17000 Human Health Std		870,000 Human Health WLA	Value is less than detection
Ethylbenzene	<5		29000 Human Health Std		150,000 Human Health WLA	Value is less than detection

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT- WATER ug/l	VIRGINIA CHRONIC CRITERIA SALTWATER ug/l	Agency default values are 2:1 acute and 50:1 chronic		COMMENTS
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		Acute (WLA _a)
				Acute (WLA _a) and Chronic (WLA _c) are calculated as follows: 26x acute and chronic standards for estuarine, per 93-015) ug/l		
Tetrachloroethylene	<5		3500 Human Health Std		180,000 Human Health Std	Value is less than detection
Vinyl Chloride	<10		5300 Human Health Std		270,000 Human Health Std	Value is less than detection
Acids Extractables						
2-Chlorophenol	<10		400 Human Health Std		20,000 Human Health WLA	Value is less than detection
2,4-Dichlorophenol	<10		790 Human Health Std		40,000 Human Health WLA	Value is less than detection
2,4-Dimethylphenol	<10		2300 Human Health Std		120,000 Human Health WLA	Value is less than detection
Pentachlorophenol	<50	13	7.9	26	400	Value is less than detection
2,4,6-Trichlorophenol	<10		65 Human Health Std		3300 Human Health WLA	Value is less than detection

Table VIII

EVALUATION OF EFFLUENT CHARACTERIZATION DATA

Outfall 003

Receiving Stream: Hardness: NA (Saltwater Limits apply)

Flow 0.40 MGD

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	Multiplier of 29 determined by Dale Phillips		COMMENTS Data from 2C application/ Attachment D evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		
				Acute (WLA _a)	Chronic (WLA _c)	
Aldrin	believed absent	1.3	0.13			Limit not evaluated
Ammonia mg/l	420	1.5	0.23	44	NA Chronic toxicity does not apply to discharge 3 hr. long)	Avg. Monthly limit of 39.6 mg/l, max daily limit of 49.0 mg/l determined from previous permit action replaced with Avg. Monthly limit of 35.8 mg/l, max daily limit of 44.0 mg/l because current analysis is more stringent.
Arsenic-trivalent, inorganic	Believed absent	69*	36*	2000*	1000*	Limit not evaluated
Cadmium	39 measured as Total	43*	9.3*	1200*	270*	No limit indicated after evaluation
Chlordane	believed absent	0.09	0.004	2.6	0.12	Limit not evaluated
Chromium-hexavalent	13 measured as Total Recoverable	1100*	50*	32000*	1500*	Total Chromium value of 13 ug/l used to show no Cr VI limit necessary
Chromium-trivalent	13 measured		No Saltwater value			Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	Multiplier of 29 determined by Dale Phillips		COMMENTS Data from 2C application/ Attachment D evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		
				Acute (WLA _a)	Chronic (WLA _c)	
	as Total Recoverable					
Copper	198 measured as Total Recoverable	5.9*	3.8*	170*	110*	No dissolved effluent data available; total recoverable data cannot be used to establish limit per 93-015, but established monitoring, based on indicated need for limit
Cyanide, Total	believed absent	1.0	1.0	29	29	No limit evaluated
DDT	believed absent	0.13	0.001	3.8	0.029	Limit not evaluated
Demeton	no information available		0.1		2.9	Limit not evaluated
Dieldrin	believed absent	0.71	0.0019	21	0.055	Limit not evaluated
Endosulfan	believed absent	0.034	0.0087	0.99	0.25	Limit not evaluated
Endrin	believed absent	0.037	0.0023	1.1	0.067	Limit not evaluated
Guthion	no information available		0.01		0.29	Limit not evaluated
Heptachlor	believed absent	0.053	0.0036	1.5	0.1	Limit not evaluated
Hydrogen Sulfide	believed		2.0		58	Limit not evaluated

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	Multiplier of 29 determined by Dale Phillips		COMMENTS Data from 2C application/ Attachment D evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		
				Acute (WLA _a)	Chronic (WLA _c)	
	absent					
Iron	Total Iron believed absent		No Saltwater Value			Limit not evaluated
.Kepone	No information available		0			Limit not evaluated
Lead	28 Total recoverable	240*	9.3*	7000*	270*	No limit indicated after evaluation
Lindane	believed absent	0.16	0.01	4.6	0.29	Limit not evaluated
Malathion	No information available		0.1		2.9	Limit not evaluated
Manganese	believed absent		100			Limit not evaluated
Mercury	believed absent	2.1*	0.025 *	61*	0.73*	All data below QL of 0.2 ug/l; no limit necessary.
Methoxychlor	No information available		0.03		0.87	Limit not evaluated
Mirex	No information available		0			Limit not evaluated
Nickel	140 Total Recoverable	75*	8.3*	2200*	2400*	No limit indicated after evaluation

PARAMETER	EFFLUENT CONCENTRATION ug/l	VIRGINIA ACUTE CRITERIA SALT WATER ug/l	VIRGINIA CHRONIC CRITERIA SALT WATER ug/l	Multiplier of 29 determined by Dale Phillips		COMMENTS Data from 2C application/ Attachment D evaluated, all units ug/l, unless otherwise specified * The metals form is the Dissolved form
				PROJECTED IN STREAM CONCENTRATION		
				AVG FLOW		
				Acute (WLA _a)	Chronic (WLA _c)	
Parathion	No information available		0.04			Limit not evaluated
Phenol	believed absent					(Human health standard of 4600000) Limit not evaluated
Phthalate Esters	believed absent		3.0			Limit not evaluated
Polychlorinated Biphenyls	believed absent		0.03		0.87	Limit not evaluated
Selenium	19 Total Selenium	300 *	71 *	8700*	2100*	No limit indicated after evaluation
Silver	0.5 Total Recoverable	2.3*		67*		No limit indicated after evaluation
Toxaphene	believed absent	0.21	0.0002	6.1	0.0058	Limit not evaluated
Tributyltin	(Total Tin believed absent--no TBT used onsite)	0.36	0.001	10	0.029	Limit not evaluated
Zinc	111 Total Recoverable	95*	86*	2800*	2500*	No limit indicated after evaluation

23. Public Notice: The draft permit will be public noticed in the Northumberland Echo. Public Notice Information required by 9 VAC 25-31-280 B:
- | Comment period | Start date | End date |
|----------------|------------|----------|
| | | |

Persons may comment in writing or by e-mail to the DEQ on the proposed reissuance of the permit and may request a public hearing during the comment period. Written or email comments shall include the name, address and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action.

Following the comment period, the Board will make a determination regarding the proposed reissuance. This determination will be come effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

- ## PREVIOUS BOARD ACTION

Omega Protein is under consent order for addressing ammonia and cyanide concentrations at 001.

REDUCED MONITORING

Reduced monitoring frequencies are not applicable to this facility because this program is not applicable to discharges that are intermittent and addressing water quality violations.

25. 303(d) Listed Segments (TMDL): This facility discharges directly to Cockrell's Creek. Because this facility has not been able to comply with limits for cyanide at 001 addressed in a previous Compliance Schedule this facility's receiving stream is listed in Part 2 of the current 303(D) list. The segment is: 1.0-MZ of Cockrell's Creek in the WQMA III Watershed (Potomac, Rappahannock, York and Bay Tributaries Area). A consent order with the company will address the cyanide issue. A TMDL has not been prepared or approved for the segment. This permit has limits of 95.9 ug/l monthly average and 110 ug/l maximum for cyanide at 001. that require compliance with the standard prior to discharge. Given these limits this facility can neither cause nor contribute to the observed violation of the standards. The permit contains a reopener condition that may allow these limits to be modified, in compliance with section 303(d)(4) of the Act once a TMDL is approved. In addition, Cockrell's Creek is impaired for shellfish consumption, requiring the TMDL reopener clause. Also, the whole creek is considered threatened for Aquatic Life use because of an exceedance of chlorophyll a at 7-COC001.61. The "threatened" category does not require the reopener clause since it does not require a TMDL. However, it is being addressed here in the fact sheet, especially considering that the area is a NEW.

NPDES PERMIT PROGRAM

Fact SheetOmega Fact Sheet
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1. Facility name and address:

Zapata Haynie Corp.
P. O. Box 175
Reedville, VA 22539Location:
State Road 659
Reedville, VA 22539

2. Permit No.: VA0003867
First issue date: January 24, 1975
Expiration date: January 24, 1985

3. Owner contact: William P. Poluk
General Manager

Phone No. 804-453-4211

4. Permit drafted by: J. K. Cunningham Date: 8/29/84

5. Headquarters: _____ Date: _____

Waived ☐ Non-waived ☒Date to EPA: 9/12/84 Date returned by EPA: _____Comments received from EPA: Yes ☐ No ☒

6. Category: Menhaden Reduction Plant SIC Code(s) 2077

7. Number of Outfalls: 001 - Air scrubber wastewater discharged into Cockrell Creek.

002 - Treated condensate from two-cell lagoon system
discharged into Cockrell Creek.003 - Condensate barged to Chesapeake Bay; this discharge
will occur only during emergencies or peak produc-
tion periods.004 - Non-contact cooling water from Evaporator System
discharged into Cockrell Creek.

8. Description of Discharge:

(X) Major
(X) Industrial
(X) Existing(X) Renewal
(X) Effluent Limited
(X) Water Quality Limited

9. Description of the Discharge - See attached sheet - Table 2...

...process stickwater and bailwater. The discharge results from processing of menhaden into fishmeal, oil and solubles.

Omega Fact Sheet
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11. Wastewater Treatment Facilities:
Evaporator - concentrates stickwater and bailwater into fish solubles.
Lagoon System - will treat all condensate from evaporator system.

12. Location of Discharges: See attached sheets.

	<u>Outfall 001, 002, 004</u>	<u>Outfall 003</u>
Receiving Stream:	Cockrell Creek	Chesapeake Bay
Basin:	Chesapeake Bay, Atlantic Ocean & Small Coastal Basin	Chesapeake Bay, Atlantic Ocean & Small Coastal Basin
Section:	2	2
Class:	II	II
Special Standard:	a	a

Applicable State Water Quality Standards:

pH	6.0 - 8.5	6.0 - 8.5
D.O.	5.0 mg/l avg.	5.0 mg/l avg.
Temperature	3°C rise above natural	3°C rise above natural
Bacteria	14/100 ml-MPN (Median)	14/100 ml-MPN (Median)

13. Section 301(b)(1)A of the Clean Water Act requires that point sources other than a POTW achieve effluent limitations based on the application of Best Conventional Technology (BCT) of conventional pollutants. The combined discharges from outfalls 001, 002, and 003 must meet BCT effluent limitations.

Section 302(a) of the Act requires that effluent limitations for point sources shall be established which are necessary to meet water quality standards. Since Cockrell Creek is a water quality limiting stream, the discharges from outfalls 001 and 002 must also meet water quality limits as determined by the mathematical model of Cockrell Creek. Outfall 004 discharges non-contact cooling water.

14. Effluent Limitations: Effluent limits for Cockrell Creek are based on a mathematical water quality study as developed by the Virginia Institute of Marine Science. This two-layer mathematical model of Cockrell Creek shows that the lower layer appears to be controlled by bottom benthic demand and not affected by the point source loadings. An average of 2,268 kg/day of carbonaceous BOD₅ will maintain an average of 5.0 mg/l dissolved oxygen in the upper layer of Cockrell Creek. 45.4 kg/day of that total will be reserved for the Reedville Sanitary District sewage treatment plant to allow for future growth, leaving the two menhaden plants with 2222.6 kg/day. Average Total Suspended Solids and average Oil and Grease are reduced by the same percentage as the BOD₅ loading was reduced by the model. Maximum values for BOD₅, and Oil and Grease are based on the same factor as found in the Federal Register for these parameters.

The BOD₅ effluent limitation for outfall 001 is net based. The intake water for outfall 001 is taken from the same body of water into which the discharge is made (Cockrell Creek). Because the discharge from outfall 001 is the result of wastewater from the air scrubber system, the pollutants present in the intake water will not be removed through the system.

Final model was run with a continuous BOD₅ loading at steady state conditions, meeting an average of 5.0 mg/l dissolved oxygen in the upper layer of the creek. Under these conditions, the model segment of the creek in which the intake and discharge points are located contains an average BOD₅ of 2.9 mg/l. This background concentration will be subtracted from the BOD₅ effluent concentration for outfall 001 to calculate the net based limitation. This information meets the criteria contained in 40 CFR, Section 122.63 (h) for granting a net limitation.

Omega
Fact
Sheet
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Effluent limitations for the Cockrell Creek discharges and the BCT limitations which include the Bay discharge are contained in Table I.

15. Monitoring: Because of the size of the discharge the plant is required to monitor BOD₅ and TSS with a 24-hour composite sample every day of operation. Oil and Grease is monitored once per week with a grab sample. Because the Oil & Grease discharge is well below effluent limitations, the monitoring frequency is adequate.
16. Schedule of Compliance: Not applicable.
17. Special Conditions: See attached sheet.
18. Additional Information: The application, proposed permit, comments received, and other information are on file and may be inspected and copied at:

State Water Control Board
Tidewater Regional Office
Division of Special Projects
Church Street
P. O. Box 669
Kilmarnock, VA 22482 (Tel: 804-435-3181)

Name of person to contact: G. T. Yagel, during the hours of 8:15 a.m. and 5:00 p.m. on business days.

Any person may comment in writing to the Board on the proposed permit no later than . All comments received within the 30-day period will be considered in the formulation of final determinations regarding the application. All comments should include the name, address and telephone number of the writer and a concise statement of the factual basis for the comments.

(X) Final Limitation

Effective Dates: From

(INDUSTRIAL)

() Interim Limitation

OUTFALL 001, 002

Parameter	BASIS						BASED ON			Permit Limit
	Effluent Guidelines			Best Profes. Judg-ment	Water * Quality Stds.	Multiplier	Production	kg/day		
	BPT	BAT	NSPS							
	(Prop)	(Prop)	(Prop)							
	(Promul)	(Promul)	(Promul)							
				BCT	BPT	BAT				
BOD ₅							5		2223 E	AVG. 1356 867 MAX. 2427 1552
TSS							5			AVG. 504 322 MAX. 1239 792
Oil & Grease							5			AVG. 244 156 MAX. 449 287
pH										6.0 - 8.5
Flow										

- *1. Per 208 Plan and date _____
2. Per 303(c) Plan and date _____
3. Per EPA and date _____
4. Per 401 Certification and date _____
5. Other Mathematical water quality study of Cockrell Creek.
6. Include toxic chart from previous rationale document (Separate Sheet)

Comega Fact Sheet
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(X) Final Limitation

Effective Dates: From

() Interim Limitation

(INDUSTRIAL)

OUTFALL 001, 002, 003

Parameter	BASIS						BASED ON		
	Effluent Guidelines			Best Profes. Judg-ment		Water * Quality Stds.	Multiplier	Production	Permit Limit
	BCT (Prop) (Promul)	BAT (Prop) (Promul)	NSPS (Prop) (Promul)						
	BCT Promul.			BCT	BPT	BAT	kg/kkg	kg	kg/day
BOD ₅	X						AVG. 3.9 MAX. 7.0	1,539,534	6004 10,777
TSS	X						AVG. 1.5 MAX. 3.7		2309 5696
Oil & Grease	X						AVG. .76 MAX. 1.4		1170 2155
pH	X								
Flow									

- *1. Per 208 Plan and date _____
2. Per 303(c) Plan and date _____
3. Per EPA and date _____
4. Per 401 Certification and date _____
5. Other _____
6. Include toxic chart from previous rationale document (Separate Sheet)

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() Interim Limitation

(INDUSTRIAL)

Outfall 004

To

Parameter	BASIS						BASED ON				
	Effluent Guidelines			Best Profes. Judg- ment			Water * Quality Stds.	Multiplier	Production	Permit Limit	Frequency
	BPT (Prop) (Promul)	BAT (Prop) (Promul)	NSPS (Prop) (Promul)								
				BCT	BPT	BAT					
Temperature							No limit				1/Day
pH							6.0-8.5				1/Day

- *1. Per 208 Plan and date _____
 2. Per 303(c) Plan and date _____
 3. Per EPA and date _____
 4. Per 401 Certification and date _____
 5. Other _____
 6. Include toxic chart from previous rationale document (Separate Sheet)

Omega Fact Sheet
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MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4900 Cox Road

Glen Allen, VA 23060

804/527-5020

SUBJECT: AMPRO Fisheries Company
TO: Technical File via Denise Mosca
FROM: Steven G. Stell
DATE: August 2, 1995
COPIES: J.R. Bell, Ray Jenkins, Mason Harper

DMR
(by Ftr 8-3-95)

RECEIVED
AUG 07 1995

We all met on August 1, 1995 to discuss the desired sampling locations for the monitoring being conducted on the barge (discharge 003 and Chesapeake Bay Monitoring). The company currently collects samples for Discharge Monitoring Report (DMR) reporting purposes and to supply additional data submitted with the DMR.

We decided that appropriate sampling locations were as follows:

DMR Reporting - Discharge 003

<u>Parameter</u>	<u>Location</u>	<u>Sample Type</u>
BOD ₅ , TSS, Ammonia	Auto sampler entering Bay barge	24 HC
Oil & Grease	Wastewater entering Bay barge	Grab
D.O., Temp.	'Blend' at discharge spigot	<u>in situ</u> ¹
pH	'Blend' at discharge spigot	Grab
Bioassay/Toxicity	'Blend' at discharge spigot	Grab

The above data will be used to report values on the DMR for Discharge 003 and used to determine the Summary Discharge 999 DMR values.

Chesapeake Bay Water Quality Monitoring - "Pre-Discharge"

<u>Parameter</u>	<u>Location</u>	<u>Sample Type</u>
BOD ₅ , Ammonia	Off stern, 10 ft. depth	Grab
D.O., Temp.	Off stern, 10 ft. depth	<u>in situ</u> ¹
pH	Off stern, 10 ft. depth	Grab

Chesapeake Bay Water Quality Monitoring - "After Discharge"

<u>Parameter</u>	<u>Location</u>	<u>Sample Type</u>
BOD ₅ , Ammonia	'Blend' discharge spigot	Grab
D.O., Temp.	'Blend' discharge spigot	<u>in situ</u> ^{1,2}
pH	'Blend' discharge spigot	Grab ²

The Chesapeake Bay Water Quality Monitoring data is submitted with the DMR.

¹ D.O. and temperature readings should be obtained in situ (in place).

² D.O., temperature and pH samples taken for Discharge 003 reporting purposes may be used for this reporting.

1sgs Note:
This page is included for information concerning the barge discharge. Omega Protein now retains ownership of the Ampro barge.

SUBJECT: Menhaden Industries Permit Reissuance - Cockrell Creek Wasteload Allocation - Northumberland County

TO: File - Kilmarnock Office

FROM: G. T. Yagel

DATE: August 15, 1979

COPIES: L. S. McBride, L. G. Lawson, A. J. Anthony, J. R. Bell, F. K. Cunningham
Dale F. Jones, Burton R. Tuxford

In anticipation of this division's responsibilities for the reissuance of permits for two menhaden industries in Northumberland County, the issue of wasteload allocation for CBOD₅ has been under consideration for more than a year. The deadline date for the reissuance is January 1980. No attempt will be made to include in this memorandum a summary of all of the items brought forth in many conferences with VIMS, the permittee consultants, and other staff members. That information can be found in our regional office file. The purpose of this memorandum is to set forth conclusions reached during a conference with personnel of BAT, BWCM, BE, and TRO-DSP on August 7, 1979 at 10:30 a.m. Personnel involved are listed below:

A. J. Anthony	- BAT
J. R. Bell	- BAT
Dale F. Jones	- BWCM
Burton R. Tuxford	- BWCM
Anne Field	- BE
G. T. Yagel	- TRO-DSP

1. VIMS model of Cockrell Creek has been verified and will be utilized as the basis for wasteload allocation of the total loading from these menhaden industries during the drafting of limitations for reissued permits.
2. In accordance with the VIMS model, 5,000 pounds per day of carbonaceous BOD is the total limit allowable for all discharges into Cockrell Creek in order that 5.0 m/l of DO will be maintained in the upper layer of that receiving stream. 100 pounds per day of that total will be reserved for the Reedville Sanitary District sewage treatment facilities in order that growth may be allowed, leaving the industries with 4,900 pounds per day.
3. The 4,900 pounds total loading is considered a daily average and not a daily maximum.
4. The upper layer of Cockrell Creek, as identified in the VIMS model will be used to determine wasteload allocation which is agreed to by BWCM.

Cockrell Creek is a tributary to the Great Wicomico. The creek empties into the river close to the river mouth. The creek has characteristics similar to the river; small drainage area (4.6 square miles, or 11.9 km²) weak tidal action and low freshwater input. Two fish processing plants as well as the town of Reedville are located on Cockrell Creek. During the summer, the two plants introduce a total of about 5000 lb/day (2300 kg/day) of five-day carbonaceous BOD and about 900 lb/day (410 kg/day) of organic nitrogen and ammonia (as N).

realistic temps
(from DMRS)

Omega Temp Std - Cooling Water Flows

001 = contact cooling water max flow 7.17 MGD

004+005 = noncontact cooling water max flows 12.4, 12.9 MGD
total Qd = 32.47

from DMRS -

	5/98	6/98	7/98	8/98
001 avg	27.7	32.7	37.3	35.3
max	30	39	42	40.0

use 45° for both Cj

004 avg	28.9	30.4	36.3	34.7
max	34	37	43	39

Cs = 90th percentile 25

$$C_m = \frac{Q_s C_s + Q_d C_d}{Q_s + Q_d}$$

$$= \frac{(288.34)(28.5) + (32.47)(45)}{288.34 + 32.47}$$

$$= 30.17 < 31.5 \text{ OK}$$

288.34 MGD use
no flow of Cedar
Creek, from 1992 F
Fact Sheet 31

at low temps, say, 8°C

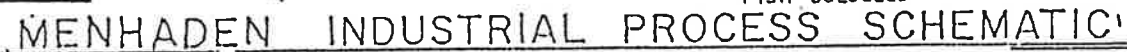
	10/97	11/97	USE
001	35.0	27.0	12/97
004	31.0	24.0	26.0
005			22.0

$$C_{m_{004+005}} = \frac{288.34(8^\circ) + (25.3)(22^\circ)}{288.34 + 25.3} = 9.13$$

$$C_{m_{001}} = \frac{(288.34 + 25.3)(9.13) + (7.17)(26.0)}{(288.34 + 25.3) + 7.17}$$

$$= 9.51^\circ\text{C} < 11^\circ\text{C} \text{ OK}$$

SIC CODE: 2077 (All Processes)

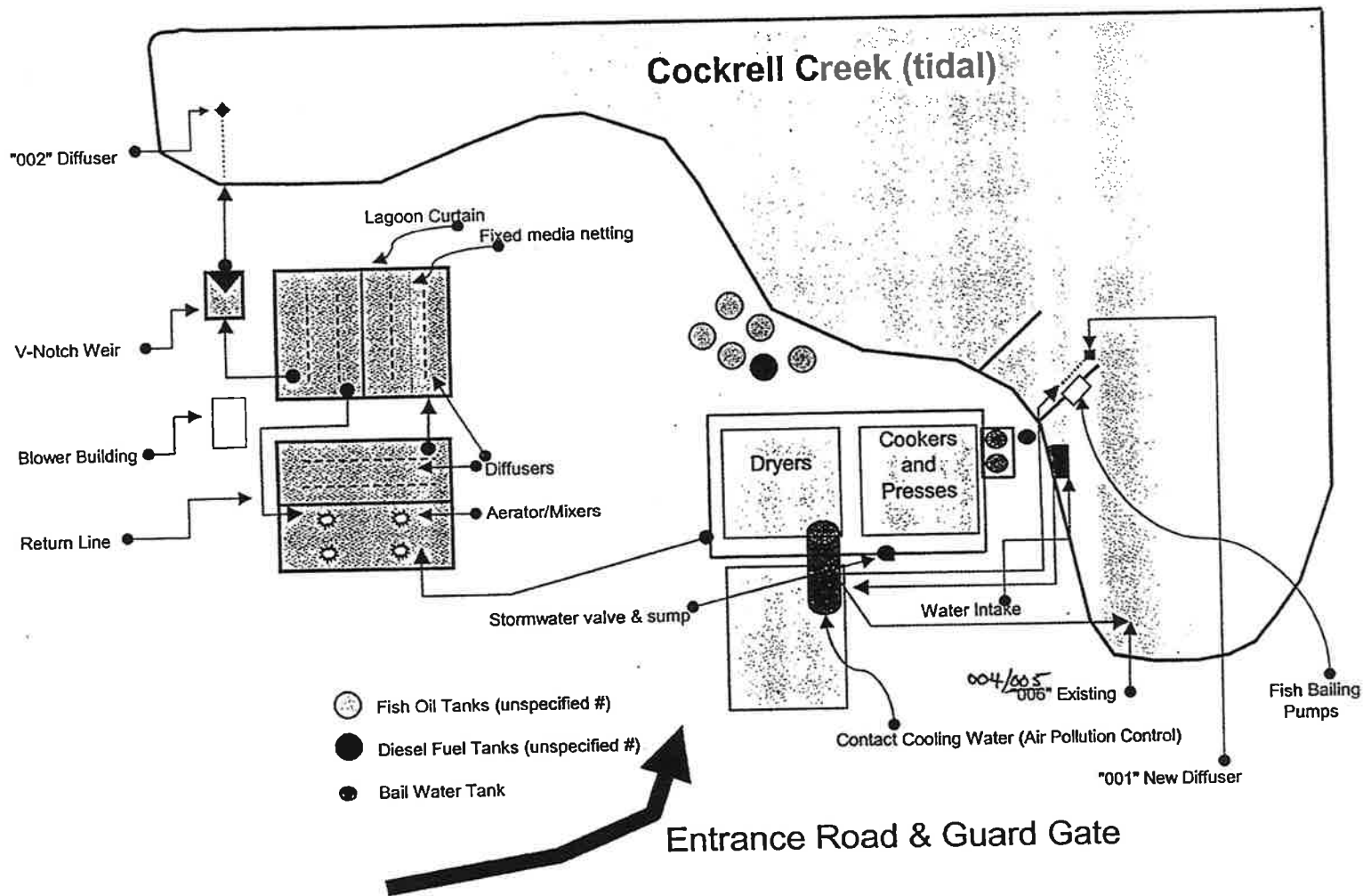


ITITACHUNMIENT-25

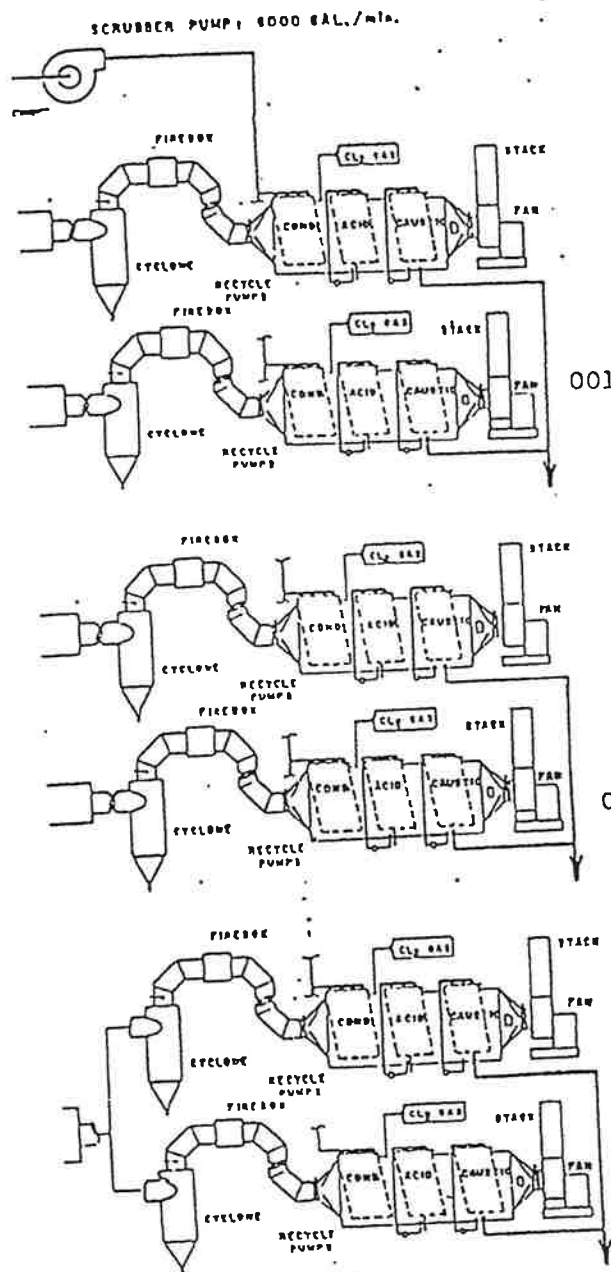
OMEGA Protein

Permit #: VA0003867
 Insp. Date: October 9, 2002
 Inspector: Steven G. Stell

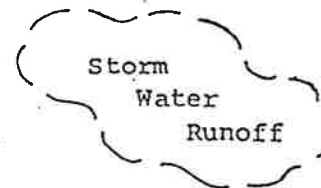
Not to scale



NOTE: SANITARY WASTEWATER IS DISCHARGED
DIRECTLY TO SERVICE AUTHORITY.

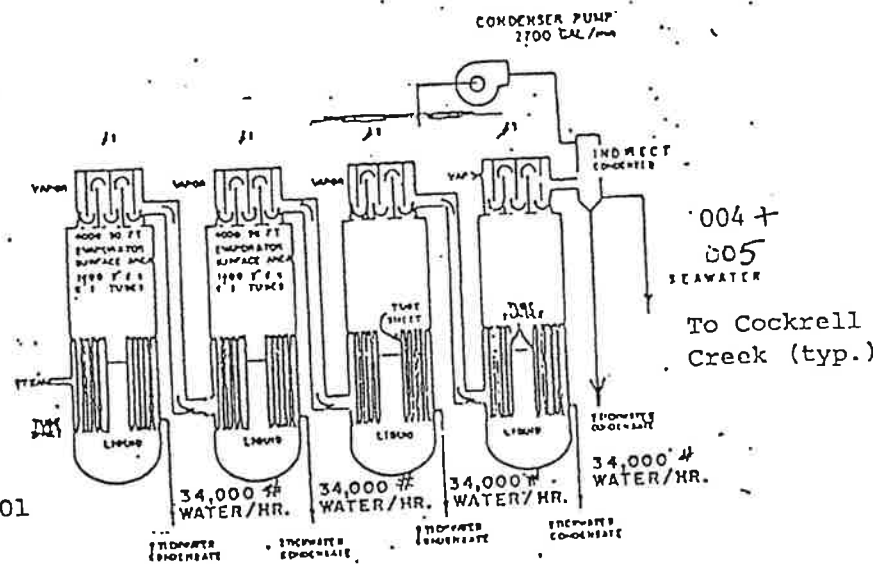


SCRUBBERS

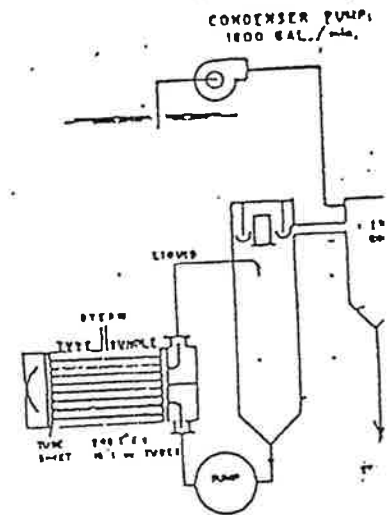


To
Cockrell Creek

Regulated by separate Stormwater General Plan



EVAPORATORS



CONCENTRATOR

001

ZAPATA HAYNIE-REEDVILLE PLANT
INDUSTRIAL WASTEWATER SOURCES

VA 0003867

NOTE: ALL CONDENSATE IS COLL
PUMPED TO THE TREATME

002

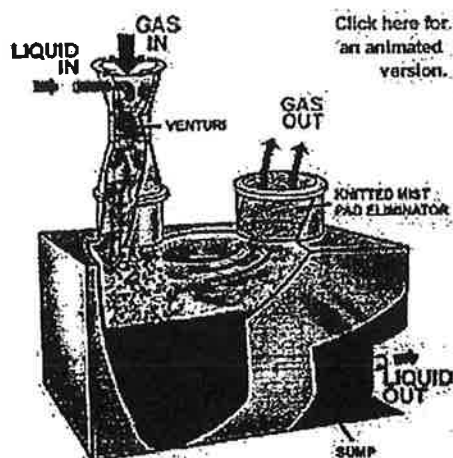
(except excess condens

ATTACHMENTS
2

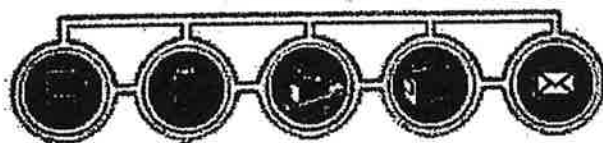
VENTURI

Fume Scrubbers

Similar to 001

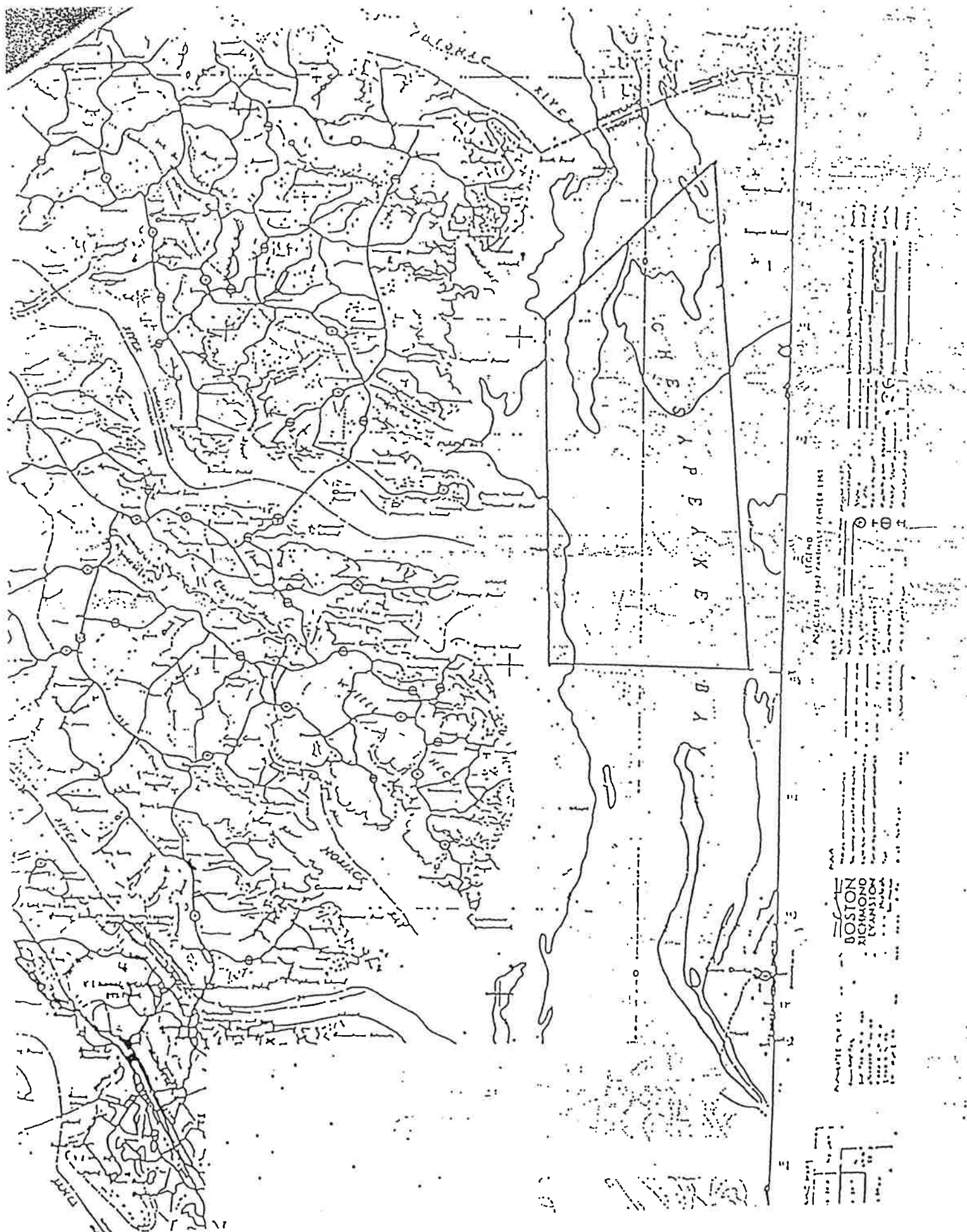


For an animated diagram Click [here](#) or the diagram on screen.



- Designed to treat exhaust streams containing particulates.
- Improved gas absorption through increased turbulence
- Co-Current flow.
- Materials of construction selected to suit given applications: Polypropylene, PVC, Halar, Glass reinforced as required, Mild Steel / Stainless Steel.
- Manufacture to BS4994 / BS5500.

[[Contents](#)] [[Packed Column](#)] [[Venturi](#)] [[Horizontal](#)] [[Contact](#)]



DRAFT YEAR 2002 303(d) IMPAIRED WATERS FACT SHEET - PRO

RIVER BASIN: CHES BAY/ATL/SM COASTAL

CITY/COUNTY: Lancaster, Northumberland, Gloucester, Virginia B

STREAM NAME: Chesapeake Bay and tidal tributaries

SEGMENT ID: VACB-R01E-01 **303(d) PART** 3 **HYDROLOGIC UNIT:** 02080102

ADB_ID: VAP-CO1E_ANT01A98

Segment Size 219.46 Sq. Mi. **Nested Size** 74.75 Sq. Mi.

INITIAL LISTING: 1998 **PRIORITY** Threatened **TMDL SCHEDULE** -

LOCATION:	DESCRIPTION:	RIVER MILE	LATITUDE	LONGITUDE
UPSTREAM LIMIT:	Virginia state line (a line from Cape Henry drawn through Buoys 3 and 8)			
DOWNSTREAM LIMIT:	Mouth of the bay (Fisherman's Island)	0.00		

Chesapeake Bay and its small coastal basins from the Virginia state line to the mouth of the bay (a line from Cape Henry drawn through Buoys 3 and 8 to Fisherman's Island), and its tidal tributaries, excluding the Potomac tributaries, James River and tributaries, Rappahannock River and tributaries, and the York River and tributaries. Excludes segments where nutrient monitoring indicates full use support.

CWA GOAL AND USE SUPPORT

Aquatic Life Use - Threatened

IMPAIRMENT CAUSE:

IMPAIRMENT SOURCE:

Nutrient Enriched Water designation

Unknown

Designated as a Nutrient Enriched Water in the Water Quality Standards.

Source is unknown.

DRAFT YEAR 2002 303(d) IMPAIRED WATERS FACT SHEET - PRO

RIVER BASIN: CHES BAY/ATL/SM COASTAL

CITY/COUNTY: Northumberland

STREAM NAME: Cockrell Creek

SEGMENT ID: VAP-C01E-08 303(d) PART 1B, 3 HYDROLOGIC UNIT: 02080102

ADB_ID: VAP-C01E_COC01A98

Segment Size 1.09 Sq. Mi. Nested Size Sq. Mi.

INITIAL LISTING: 1998 PRIORITY: Low TMDL SCHEDULE: - 4/1/10

LOCATION:	DESCRIPTION:	RIVER MILE	LATITUDE	LONGITUDE
UPSTREAM LIMIT:	Upstream condemnation boundary	3.49	37.8592	-76.2944
DOWNSSTREAM LIMIT:	Downstream condemnation boundary	0.12	37.3183	-76.2861

Described in VDH Notice and Description of Shellfish Condemnation Number 002A and B.

CWA GOAL AND USE SUPPORT

Shellfishing Use - Partially Supporting

Aquatic Life Use - Threatened

IMPAIRMENT CAUSE:

IMPAIRMENT SOURCE:

VDH Shellfish Restriction
Chlorophyll A

Unknown

VDH-DSS Shellfish Condemnation 2A, B,
9/14/1993.
Chlorophyll A 5/23 at 7-COC001.61

Source is unknown. Condemnation B
consists of an area around a VPDES point
source outfall which is prohibited - use
removed.

DRAFT YEAR 2002 303(d) IMPAIRED WATERS FACT SHEET - PRO

RIVER BASIN: CHES BAY/ATL/SM COASTAL

CITY/COUNTY: Northumberland

STREAM NAME: Cockrell Creek

SEGMENT ID: VAP-C01E-29

303(d) PART 2

HYDROLOGIC UNIT: 02070011

ADB_ID: 303(d) Part II segment

Segment Size 0.01 Sq. Mi.

Nested Size

Sq. Mi.

INITIAL LISTING: 2002

PRIORITY: None

TMDL SCHEDULE:

- 1/28/2003

LOCATION:	DESCRIPTION:	RIVER MILE	LATITUDE	LONGITUDE
UPSTREAM LIMIT:	Reedville Sanitary District STP discharge	1.41	37.8333	-76.2778
DOWNSTREAM LIMIT:	Mixing Zone	MZ	37.8333	-76.2778

Mixing Zone of the Reedville Sanitary District STP discharge.

CWA GOAL AND USE SUPPORT

Aquatic Life Use - Partially Supporting

IMPAIRMENT CAUSE:

IMPAIRMENT SOURCE:

Chlorine

PS - Municipal

1/28/2003 compliance schedule for chlorine.

VA0060712 - Reedville Sanitary District's
Municipal STP

2002 303(d) PART 1A IMPAIRED WATERS FACT SHEET

RIVER BASIN: CHESAPEAKE BAY/ATLANTIC/SMALL COASTAL BASINS
CITY/COUNTY: Contiguous Counties and Cities
STREAM NAME: Chesapeake Bay - Northwest
HYDROLOGIC UNIT: 02080101
SEGMENT ID.: VACB_R01-03A **TMDL MAP ID:**
SEGMENT SIZE:
INITIAL LISTING: 1998 **TMDL Schedule:** -
UPSTREAM LIMIT:

DESCRIPTION:

RIVER MILE:

LATITUDE:

LONGITUDE:

DOWNSTREAM LIMIT:

DESCRIPTION:

RIVER MILE:

LATITUDE:

LONGITUDE:

This segment encompasses nearshore water of western Chesapeake Bay from mouth of Great Wicomico River southward to mouth of Piankatank River. Includes monitoring stations CB5.4W, LE3.6, LE3.7

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Partial Supporting

IMPAIRMENT CAUSE:

Dissolved Oxygen, Turbidity

Desig. Use Std (Benthic)

Nutrient Enriched Waters designation

IMPAIRMENT SOURCE

Nonpoint Sources

Municipal Pointsources

Stratification

SUMMARY:

This segment is partially supporting for the Clean Water Act's Aquatic Life Use Support Goal for the 2002 305(b) report due to being listed by EPA in 1998 as being impaired because of low dissolved oxygen, nutrients, and turbidity. The 2002 Assessment of data at stations CB5.4W, LE3.6, and LE3.7 indicates no impairment by Dissolved Oxygen. (<10% violations in top layer, <10% violations in bottom layer). The segment is also threatened for the Clean Water Act's Aquatic Life Use Support Goal because greater than 25% of probabilistically sited benthic IBI stations exceeded the threshold of 2.0 (60% <= 2.0). The segment is also threatened for the Clean Water Act's Aquatic Life Use Support Goal because it is designated as a Nutrient Enriched Water in State Water Quality Standards.



ATTACHMENT 5

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

PIEDMONT REGIONAL OFFICE

4949-A Cox Road
Glen Allen, Virginia 23060
(804) 527-5020
Fax (804) 527-5106
<http://www.deq.state.va.us>

Dennis H. Treacy
Director

Gerard Seeley, Jr.
Piedmont Regional Director

October 4, 2001

Mr. G. Lyell Jett
General Manager
Omega Protein
P.O. Box 175
Reedville, VA 22539



RE: VPDES Permit VA#0003867 - Wastewater Treatment

Dear Mr. Jett:

Enclosed are copies of the reports on the Technical Inspection conducted at your facility on September 12, 2001. Please review the report and respond to the Compliance Recommendations and General Recommendations presented in the summary (Page Five). Also enclosed is a copy of the Laboratory Inspection conducted on the same date. The facility has received an unsatisfactory rating (see Page Three of the Laboratory Inspection Report). I reviewed the deficiencies found during the inspection and discussed the required corrective actions with your staff.

You are requested to provide a written response addressing the numbered General Recommendations identified on Page Five of the *Wastewater Facility Inspection Report* by October 31, 2001. In addition, you are requested to send written notification and documentation addressing the Summary items identified beginning on Page Three of the *Laboratory Inspection Report* by October 31, 2001.

Please send a copy of your lab results of the split sampling we conducted during the inspection. I will forward you a copy of our results when they are available. If you have any questions regarding this report or the actions required, contact me at (804) 527-5055.

Sincerely,

Steven G. Stell
Chief Inspector

cc: DEQ - Kilmarnock Office
DEQ - OWPS
~~VDH - DWE~~

An Agency of the Natural Resources Secretariat

Wastewater Facility Inspection Report

Facility Name: Omega Protein Facility No.: VA0003867
 City/County: Northumberland Inspection Agency: DEQ
 Inspection Date: Sept. 12, 2001 (1027-1537 hrs) Date Form Completed: October 2, 2001
 Inspector: Steven G. Stell Time Spent: 16 hrs. w/ travel & report
 Reviewed By: CHW and 10/3/01 Unannounced Insp.? Yes
 FY-Scheduled Insp.? Yes

Present at Inspection: Andy Hall (Plant Manager)

TYPE OF FACILITY:

Domestic Industrial
☐ Federal ☐ Major ☒ Major ☐ Primary
☐ Non-Federal ☐ Minor ☐ Minor ☐ Secondary
 Population Served: approx.: (N/A)
 Number of Connections: approx.: 1

TYPE OF INSPECTION:

☒ Routine Date of last inspection: November 1, 2000
☐ Compliance Agency: DEQ/PRO
☐ Reinspection

EFFLUENT MONITORING: See Discharge Monitoring Reports (DMR) in file

Last month average: BOD: ____ mg/L TSS: ____ mg/L Flow: ____ MGD
 (Influent) Date: ____
 Other: ____
 Last month: BOD: ____ mg/L TSS: ____ mg/L Flow: ____ MGD
 (Effluent) Date: ____
 Other: ____
 Quarter average: BOD: ____ mg/L TSS: ____ mg/L Flow: ____ MGD
 (Effluent) Date: ____
 Other: ____

CHANGES AND/OR CONSTRUCTION

DATA VERIFIED IN PREFACE ☒ Updated ☐ No changes
 Has there been any new construction? ☐ Yes* ☒ No
 If yes, were plans and specifications approved? ☐ Yes ☐ No* ☒ N/A
 DEQ approval date: 002 Diffuser (approval date not ascertained)

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: Class I - 0, Class II - 0, Class III - 1, Class IV - 0, Trainee - 0
2. Hours per day plant is staffed: 1-2 hrs (at WWTF) 24 hrs/day (Security at factory)
3. Describe adequacy of staffing: ☐ Good ☒ Average ☐ Poor*
4. Does the plant have an established program for training personnel? ☐ Yes ☒ No
5. Describe the adequacy of the training program: ☐ Good ☐ Average ☒ Poor*
6. Are preventive maintenance tasks scheduled? ☒ Yes ☐ No*
7. Describe the adequacy of maintenance: ☐ Good ☒ Average ☐ Poor*
8. Does the plant experience any organic/hydraulic overloading? ☐ Yes* ☒ No
 If yes, identify cause and impact on plant: N/A
9. Any bypassing since last inspection? ☐ Yes* ☒ No
10. Is the on-site electric generator operational? ☐ Yes ☐ No* ☒ N/A
11. Is the STP alarm system operational? ☐ Yes ☐ No* ☒ N/A
12. How often is the standby generator exercised? ☐ Weekly ☐ Monthly ☒ Other: N/A
 Power Transfer Switch? ☐ Weekly ☐ Monthly ☒ Other: N/A
 Alarm System? ☐ Weekly ☐ Monthly ☒ Other: N/A
13. When were the cross connection control devices last tested on the potable water service? N/A
14. Is sludge disposed in accordance with the approved sludge disposal plan? ☐ Yes ☐ No* ☒ N/A
15. Is septage received by the facility? ☐ Yes ☒ No
 Is septage loading controlled? ☐ Yes ☐ No* ☒ N/A
 Are records maintained? ☐ Yes ☐ No* ☒ N/A
16. Overall appearance of facility: ☐ Good ☒ Average ☐ Poor*

Comments: #1 - Steve Jones is the only licensed operator and all wastewater process changes and adjustments must be done under his direct supervision. #4 & #5 - No formal training program exists for the wastewater treatment system.

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?
- | | | | |
|--|---|---|---|
| Operational Logs for each unit process | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Instrument maintenance and calibration | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Mechanical equipment maintenance | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Industrial waste contribution (Municipal Facilities) | <input type="checkbox"/> Yes | <input type="checkbox"/> No* | <input checked="" type="checkbox"/> N/A |
2. What does the operational log contain?
- | | | | |
|----------------------|---|--|---|
| Visual Observations | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A |
| Flow Measurement | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| Laboratory Results | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| Process Adjustments | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Control Calculations | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| Other: | <u>N/A</u> | | |
3. What do the mechanical equipment records contain:
- | | | | |
|-----------------------------|------------------------------|---|------------------------------|
| As built plans and specs? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Spare parts inventory? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Manufacturers instructions? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Equipment/parts suppliers? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Lubrication schedules? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Other: | <u>N/A</u> | | |
| Comments: | <u>None</u> | | |
4. What do the industrial waste contribution records contain:
- (Applicable to municipal facilities only)*
- | | | | |
|--------------------------------|------------------------------|------------------------------|---|
| Waste characteristics? | <input type="checkbox"/> Yes | <input type="checkbox"/> No* | <input checked="" type="checkbox"/> N/A |
| Locations and discharge types? | <input type="checkbox"/> Yes | <input type="checkbox"/> No* | <input checked="" type="checkbox"/> N/A |
| Impact on plant? | <input type="checkbox"/> Yes | <input type="checkbox"/> No* | <input checked="" type="checkbox"/> N/A |
| Other: | <u>N/A</u> | | |
| Comments: | <u>None</u> | | |
5. Are the following records maintained at the plant:
- | | | | |
|--------------------------------|---|------------------------------|---|
| Equipment maintenance records | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Operational Log | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Industrial contributor records | <input type="checkbox"/> Yes | <input type="checkbox"/> No* | <input checked="" type="checkbox"/> N/A |
| Instrumentation records | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| Sampling and testing records | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
6. Are records maintained at a different location?
- Where are the records maintained? All are available on site.
7. Were the records reviewed during the inspection
- | | | |
|--|---|-----------------------------|
| | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
|--|---|-----------------------------|
8. Are the records adequate and the O & M Manual current?
- | | | | |
|--|---|------------------------------|------------------------------|
| | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
|--|---|------------------------------|------------------------------|
- O&M Manual date written: July 27, 1998
- Date DEQ approved O&M: (not ascertained)
9. Are the records maintained for required 3-year period?
- | | | |
|--|---|------------------------------|
| | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* |
|--|---|------------------------------|

Comments: #1 - No operational log per se. Maintenance notes and lab results kept in logs. #3 - Few mechanical equipment records are maintained, as there is little mechanical equipment (blowers and aerators). #7 - The equipment maintenance logs were not evaluated during this inspection.

(C) SAMPLING

- | | | | |
|--|---|------------------------------|------------------------------|
| 1. Are sampling locations capable of providing representative samples? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| 2. Do sample types correspond to those required by the permit? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| 3. Do sampling frequencies correspond to those required by the permit? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| 4. Are composite samples collected in proportion to flow? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| 5. Are composite samples refrigerated during collection? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| 6. Does plant maintain required records of sampling? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |
| 7. Does plant run operational control tests? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> N/A |

Comments:

(D) TESTING

1. Who performs the testing? ☒ Plant/ Lab
☐ Central Lab
☒ Commercial Lab - Name: Clifford & Assoc.

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? N/A
3. Is sufficient equipment available to perform required tests? ☒ Yes ☐ No* ☐ N/A
4. Does testing equipment appear to be clean and/or operable? ☒ Yes ☐ No* ☐ N/A

Comments: Please see enclosed DEQ *Laboratory Inspection Report*.

(E) FOR INDUSTRIAL FACILITIES W/ TECHNOLOGY BASED LIMITS

1. Is the production process as described in the permit application? (If no, describe changes in comments)
☒ Yes ☐ No* ☐ N/A
2. Do products and production rates correspond to the permit application? (If no, list differences in comments section)
☒ Yes ☐ No* ☐ N/A
3. Has the State been notified of the changes and their impact on plant effluent?
☐ Yes ☐ No* ☒ N/A

Comments: None

FOLLOW UP TO COMPLIANCE RECOMMENDATIONS FROM THE November 1, 2000 DEQ INSPECTION:

1. Repair the discharge valve in the lagoon so that the discharge at Outfall 002 can be regulated. The valve must be able to be closed so that an unplanned discharge does not occur. *[Replaced]*

FOLLOW UP TO GENERAL RECOMMENDATIONS FROM THE November 1, 2000 DEQ INSPECTION:

1. None

INSPECTION REPORT SUMMARY**Compliance Recommendations/Request for Corrective Action:**

1. Repair aeration line leaks.
2. Repair berm damage (holes at aeration line leaks and animal burrows).

General Recommendations/Observations:

1. Continue to manage burrowing animals to prevent berm damage.

Comments:

The factory area is curbed and bermed to contain and recycle runoff and spills from within this area (to Stick Water Tank). A locked valve prevents runoff from leaving the sump collection area. Only the Plant Manager has access to this key. In the off season the area is cleaned up and monitored routinely to prevent contaminated runoff from leaving the site.

Outfall 006 is a new outfall identified in the most recent permit reissuance that combines former Outfalls 001, 004, and 005. Outfall 006 is the wastestream for the scrubbers (air pollution control equipment) and an emergency discharge for the evaporator condensate and noncontact cooling water from the evaporators.

Best Management Practices (BMP) monthly reports are submitted along with the Discharge Monitoring Report (DMR). Each vessel (currently 10 boats) reportedly maintains a "Bailing Water Discharge Log", as per the Permit, which documents location and amount of refrigeration water discharged to the Chesapeake Bay. These reports are turned into the facility at the end of the season (~May through December).

Fish meal and fish oils are produced. The oils are stored in above ground storage tanks which are protected by spill containment measures (diked). The former factory across the river has been idled and is mostly demolished, however meal and oils are stored at that site too. Containment areas also protect #6 Fuel Oil and diesel above ground storage tanks.

Areas of emphasis (Compliance Assessment) – check all that apply:

<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Operational Units
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Evaluation of O & M Manual
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Maintenance Records
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pathogen Reduction & Vector Attraction Reduction
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sludge Disposal Plan
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Groundwater Monitoring Plan
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Storm Water Pollution Prevention Plan
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Permit Special Conditions
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Permit Water Quality Chemical Monitoring
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Laboratory Records (see Lab Report)

UNIT PROCESS: Ponds/Lagoons

1. Type: ☒ Aerated ☐ Unaerated ☐ Polishing
2. No. of cells: 2
Number in Operation: 2
3. Color: ☒ Green ☐ D. Brown ☐ L. Brown ☐ Grey
☐ Other _____
4. Odor: ☐ Septic * ☐ Earthy ☒ None
☐ Other: _____
5. System operated in: ☒ Series ☐ Parallel ☐ N/A
6. If aerated, are lagoon contents mixed adequately? ☒ Yes ☐ No * ☐ N/A
7. If aerated, is aeration system operating properly? ☒ Yes ☐ No * ☐ N/A
8. Evidence of following problems:
- | | | |
|-----------------------------------|---|--|
| a. Vegetation in lagoon or dikes? | <input type="checkbox"/> Yes * | <input checked="" type="checkbox"/> No |
| b. Rodents burrowing on dikes? | <input checked="" type="checkbox"/> Yes * | <input type="checkbox"/> No |
| c. Erosion? | <input type="checkbox"/> Yes * | <input checked="" type="checkbox"/> No |
| d. Sludge bars? | <input type="checkbox"/> Yes * | <input checked="" type="checkbox"/> No |
| e. Excessive foam? | <input type="checkbox"/> Yes * | <input checked="" type="checkbox"/> No |
| f. Floating material? | <input type="checkbox"/> Yes * | <input checked="" type="checkbox"/> No |
9. Fencing intact? ☒ Yes ☐ No *
10. Grass maintained properly: ☒ Yes ☐ No
11. Level control valves working properly? ☒ Yes ☐ No * ☐ N/A
12. Effluent discharge elevation: ☒ Top ☐ Middle ☐ Bottom
13. Available freeboard: approx. 1 ft.
14. Appearance of effluent: ☐ Good ☒ Fair ☐ Poor *
15. Are monitoring wells present? ☐ Yes ☒ No
Are wells adequately protected from runoff? ☐ Yes ☐ No * ☒ N/A
Are caps on and secured? ☐ Yes ☐ No * ☒ N/A
16. General condition: ☐ Good ☒ Fair ☐ Poor *

Comments: #3 - The first lagoon is bright light green and the second is dark green. #8. - Several holes (some large) exist on the berm where PVC aeration piping has deteriorated and leaks. Facility has replaced some piping with ductile pipe. There was a build up of dark brown to black solids along the edges of the lagoon. #12. - The top discharge is located at a fixed level. The two aerated lagoons operate in series and receive condensate water from the evaporators. Each lagoon has a curtain to improve biological treatment and extend retention time. The first lagoon is equipped with mechanical aspirator aerators and finer aeration diffusers are in place in the second lagoon. Four blowers (two in each building) are used to provide diffused air 24 hours/day. The wastewater level is lowered when the aeration lines need servicing.

UNIT PROCESS: Flow Measurement

Outfall 002

☐ Influent ☐ Intermediate ☒ Effluent

1. Type measuring device: 90° v-notch weir w/ultrasonic sensor
2. Present reading: 6.02" and 200 gpm (or 0.288 MGD)
3. Bypass channel? ☐ Yes ☒ No
 Metered? ☐ Yes ☐ No* ☒ N/A
4. Return flows discharged upstream from meter? ☐ Yes ☒ No
 If Yes, identify: _____
5. Device operating properly? ☒ Yes ☐ No*
6. Date of last calibration: 5/15/2001
7. Evidence of following problems:
 - a. Obstructions? ☐ Yes* ☒ No
 - b. Grease? ☐ Yes* ☒ No
8. General condition: ☒ Good ☐ Fair ☐ Poor*

Comments: #2 - The staff gauge read approximately 0.48', which is 5.75" (compared to the 6.02" reading). The staff gauge may not be properly zeroed to the V-Notch zero discharge point. Outfall 002 is the discharge from the aerated lagoons. The automatic sampler at this location is tied into the flow meter for flow proportional sampling.

UNIT PROCESS: Flow Measurement

Outfall 006

☐ Influent ☐ Intermediate ☒ Effluent

1. Type measuring device: None
2. Present reading: Based on pump run times (9.172 MGD aver. for 8/2001)
3. Bypass channel? ☐ Yes ☒ No
Metered? ☐ Yes ☐ No* ☒ N/A
4. Return flows discharged upstream from meter? ☐ Yes ☒ No
If Yes, identify: N/A
5. Device operating properly? ☐ Yes ☐ No* ☒ N/A
6. Date of last calibration: N/A
7. Evidence of following problems:
a. Obstructions? ☐ Yes* ☒ No
b. Grease? ☐ Yes* ☒ No
8. General condition: ☒ Good ☐ Fair ☐ Poor*

Comments: Outfall 006 is a new outfall that combines former Outfalls 001, 004 and 005. This is "contact" cooling water from the Air Pollution Scrubbers. The automatic sampler collects 100 mL of sample every nine minutes for the 24 hr. composite.

UNIT PROCESS: Effluent/Plant Outfall

1. Type outfall: ☒ Shore based ☐ Submerged
2. Type if shore based: ☐ Wingwall ☒ Headwall ☐ Rip Rap ☐ N/A
3. Flapper valve? ☐ Yes ☒ No
4. Erosion of bank? ☐ Yes* ☒ No ☐ N/A
5. Effluent plume visible? ☐ Yes * ☒ No

Comments: There is a diffuser for Outfall 002, but not for Outfall 006.

6. Condition of outfall and supporting structures: ☒ Good ☐ Fair ☐ Poor *
7. Final effluent, evidence of following problems:
 - a. Oil sheen? ☐ Yes* ☒ No
 - b. Grease? ☐ Yes* ☒ No
 - c. Sludge bar? ☐ Yes* ☒ No
 - d. Turbid effluent? ☐ Yes* ☒ No
 - e. Visible foam? ☐ Yes* ☒ No
 - f. Unusual odor? ☐ Yes* ☒ No

Comments: There were no unusual conditions noted at either outfall.

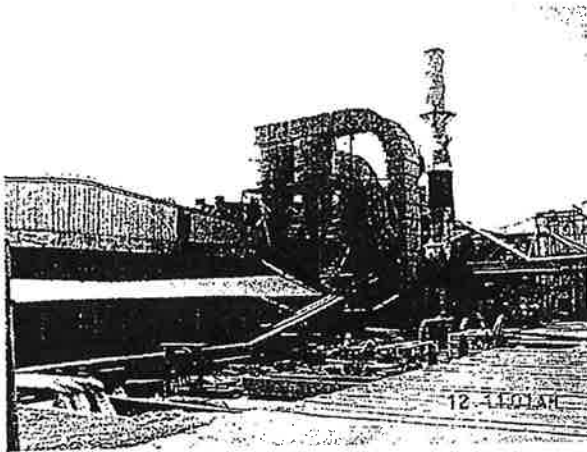
cc:

- ☒ Owner: c/o Mr. Steve Jones, General Manager
- ☐ Operator: _____
- ☐ Local Health Department: _____
- ☐ VDH Engineering Field Office: Field Office
- ☐ VDH/Central Office - DWE
- ☒ DEQ - OWPS, attn: Bill Purcell
- ☒ DEQ - Regional Office File
- ☒ EPA - Region III

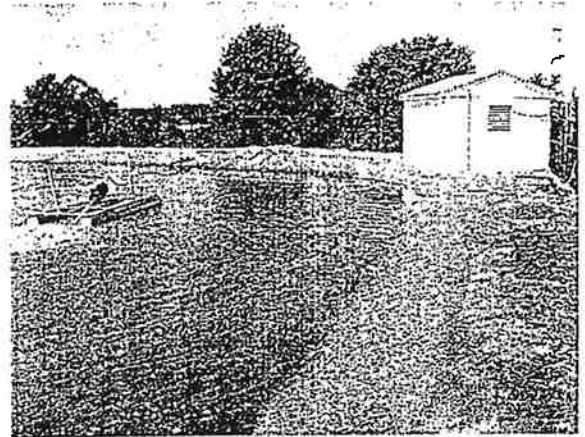
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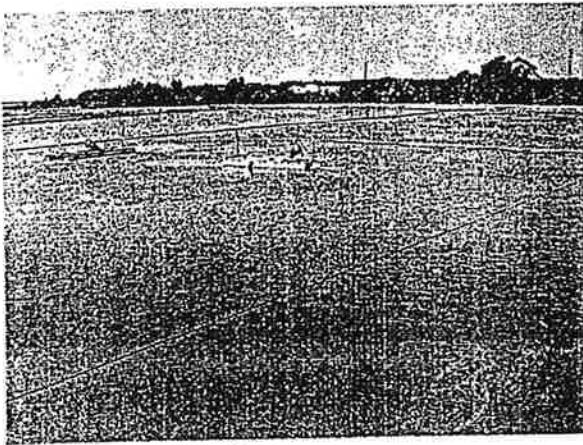
Photographs (September 12, 2001)



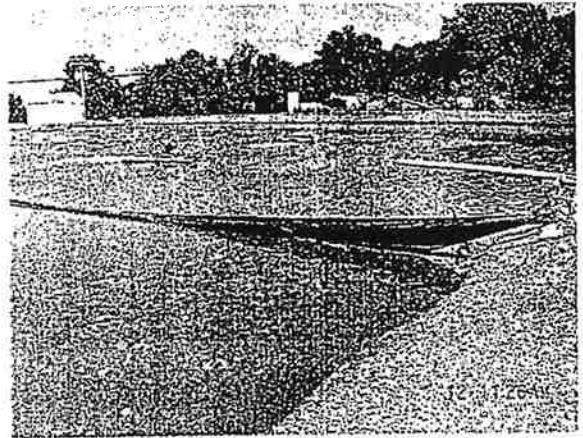
Contact (3 pipes) & Non Contact Cooling Water Outfall 006



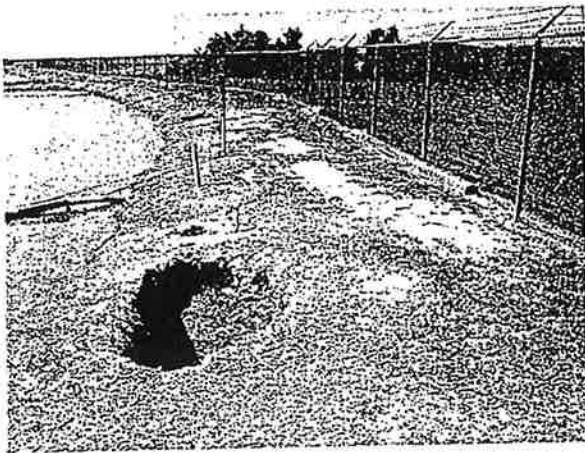
Influent to Lagoon #1 (low spot freeboard ~10")



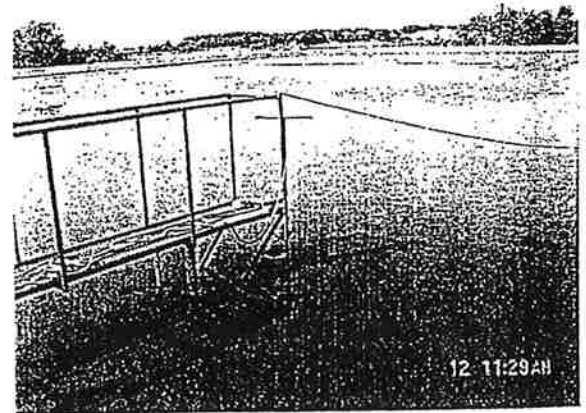
Lagoon #1, Cell #1 - Aspirating aerators



Lagoon #1 curtain with "window" forms 2 cells



Berm damage from PVC aeration pipe leaks



Lagoon #2, Cell #4 - Fine aeration. Surface (top) discharge

§ 408.143 [Reserved]

§ 408.144 Pretreatment standards for existing sources.

The pretreatment standards under section 307(b) of the Act for a source within the tuna processing subcategory which is a user of a publicly owned treatment works and a major contributing industry as defined in 40 CFR Part 128 (and which would be an existing point source subject to section 301 of the Act, if it were to discharge pollutants to the navigable waters), shall be the standard set forth in 40 CFR Part 128, except that, for the purpose of this section, 40 CFR 128.121, 128.122, 128.132, and 128.133 shall not apply. The following pretreatment standard establishes the quantity or quality of pollutants or pollutant properties controlled by this section which may be discharged to a publicly owned treatment works by a point source subject to the provisions of this subpart.

Pollutant or pollutant property	Pretreatment standard
pH	No limitation.
BOO5	Do.
Oil and grease	Do.

§ 408.145 Standards of performance for new sources.

The following standards of performance establish the quantity or quality of pollutants or pollutant properties controlled by this section, which may be discharged by a new source subject to the provisions of this subpart:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kg/kg of seafood)	
BOO5	20	5.1
TSS	7.5	3.0
Oil and grease	1.9	0.75
pH	(1)	(1)
	English units (lb/1,000 lb of seafood)	
BOO5	20	5.1
TSS	7.5	3.0
Oil and grease	1.9	0.75
pH	(1)	(1)

(1) Within the range 6.0 to 9.0.

§ 408.146 Pretreatment standards for new sources.

The pretreatment standards for incompatible pollutants under section 307(c) of the Act for a source within the tuna processing subcategory, which is a user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act if it were to discharge pollutants to the navigable waters), shall be the standard set forth in 40 CFR Part 128, except for § 128.133. Subject to the provisions of 40 CFR Part 128, process waste waters from a new source subject to the provisions of this subpart may be introduced into a publicly owned treatment works.

§ 408.147 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16 in § 408.142 of this subpart for the best practicable control technology currently available (BPT)).

[408.147 added by 51 FR 24996, July 9, 1986]

Subpart O—Fish Meal Processing Subcategory

§ 408.150 Applicability; description of the fish meal processing subcategory.

The provisions of this subpart are applicable to discharges resulting from the processing of menhaden on the Gulf and Atlantic Coasts and the processing of anchovy on the West Coast into fish meal, oil and solubles.

§ 408.151 Specialized definitions.

For the purpose of this subpart:

(a) Except as provided below, the general definitions, abbreviations and methods of analysis set forth in Part 401 of this chapter shall apply to this subpart.

(b) The term "seafood" shall mean the raw material, including freshwater and saltwater fish and shellfish, to be processed, in the form in which it received at the processing plant.

§ 408.152 Effluent limitations: guideline representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

(a) In establishing the limitation set forth in this section, EPA took into account all information it was able to collect, develop and solicit with respect to factors (such as age and size of plant, raw materials, manufacturing processes, products produced, treatment technology available, energy requirements and costs) which can affect the industry subcategorization and effluent levels established. It is, however, possible that data which would affect these limitations have not been available and, as a result, these limitations should be adjusted for certain plants in this industry. An individual discharger or other interested person may submit evidence to the Regional Administrator (or to the State, if the State has the authority to issue NPDES permits) that factors relating to the equipment or facilities involved, the process applied, or other such factors related to such discharge are fundamentally different from the factors considered in the establishment of the guidelines. On the basis of such evidence or other available information, the Regional Administrator (or the State) will make a written finding that such factors are or are not fundamentally different for that facility compared to those specified in the Development Document. If such fundamentally different factors are found to exist, the Regional Administrator or the State shall establish for the discharger effluent limitations in the NPDES permit either more or less stringent than the limitations established herein, to the extent dictated by such fundamentally different factors. Such limitations must be approved by the Administrator of the Environmental Protection Agency. The Administrator may approve or disapprove such limitations, specify other limitations, or initiate proceedings to revise these regulations.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties controlled by this section, which may be

[Sec. 408.152(b)]

discharged by a point source subject to the provisions of this subpart after application of the best practicable control technology currently available:

(1) Any menhaden or anchovy fish meal reduction facility which utilizes a soluble plant to process stick water or ball water shall meet the following limitations.

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of seafood)	
BOD ₅	7.0	3.9
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	(¹)	(¹)
	English units (pounds per 1,000 lb of seafood)	
BOD ₅	7.0	3.9
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	(¹)	(¹)

¹ Within the range 6.0 to 9.0.

(2) Any menhaden or anchovy fish meal reduction facility not covered under § 408.152(b)(1) shall meet the following limitations:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kg/kg of seafood)	
BOD ₅	3.5	2.8
TSS	2.6	1.7
Oil and grease	3.2	1.4
pH	(¹)	(¹)
	English units (lb/1,000 lb of seafood)	
BOD ₅	3.5	2.8
TSS	2.6	1.7
Oil and grease	3.2	1.4
pH	(¹)	(¹)

¹ Within the range 6.0 to 9.0.

§ 408.153 [Reserved]

§ 408.154 Pretreatment standards for existing sources.

The pretreatment standard under section 307(b) of the Act for a source

within the fish meal processing subcategory which is a user of a publicly owned treatment works and a major contributing industry as defined in Part 128 of this chapter (and which would be an existing point source subject to section 301 of the Act, if it were to discharge pollutants to the navigable waters), shall be the standard set forth in Part 128 of this chapter except that, for the purpose of this section, §§ 128.121, 128.122, 128.132 and 128.133 of this chapter shall not apply. The following pretreatment standard establishes the quantity or quality of pollutants or pollutant properties controlled by this section which may be discharged to a publicly owned treatment works by a point source subject to the provisions of this subpart.

Pollutant or pollutant property	Pretreatment standard
BOD ₅	No limitation.
TSS	Do.
pH	Do.
Oil and grease	Do.

§ 408.155 Standards of performance for new sources.

The following standards of performance establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a new source subject to the provisions of this subpart:

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of seafood)	
BOD ₅	6.7	3.8
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	(¹)	(¹)
	English units (pounds per 1,000 lb of seafood)	
BOD ₅	6.7	3.8
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	(¹)	(¹)

¹ Within the range 6.0 to 9.0.

§ 408.156 Pretreatment standards for new sources.

The pretreatment standard under section 307(c) of the Act for a new

source within the fish meal processing subcategory which is a user of a publicly owned treatment works and a major contributing industry as defined in Part 128 of this chapter (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to the navigable waters), shall be the same standard as set forth in Part 128 of this chapter, for existing sources, except that, for the purpose of this section, §§ 128.121, 128.122, 128.132 and 128.133 of this chapter shall not apply. The following pretreatment standard establishes the quantity or quality of pollutants or pollutant properties controlled by this section which may be discharged to a publicly owned treatment works by a new source subject to the provisions of this subpart:

Pollutant or pollutant property	Pretreatment standard
BOD ₅	No limitation.
TSS	Do.
pH	Do.
Oil and grease	Do.

§ 408.157 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§ 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in § 401.16 in § 408.152 of this subpart for the best practicable control technology currently available (BPT).

[408.157 added by 51 FR 24996, July 9, 1986]

Subpart P—Alaskan Hand-Butchered Salmon Processing Subcategory

§ 408.160 Applicability; description of the Alaskan hand-butchered salmon processing subcategory.

The provisions of this subpart are applicable to discharges resulting from the hand-butchered of salmon in Alaska.

[Sec. 408.160]

Water Quality Standards and Wasteload Allocations for Saltwater and Transition Zones

Permittee:

Omega Protein 001

Permit No.

VA0003867

Receiving Stream:

Cockrell's Creek

WQ Tier

1 (1 or 2)

Tidal Zone

1 (1 = saltwater
2 = transition zone)

Design Flow (MGD)

Chronic WLA multiplier

107 (default = 51 or 50:1 mixing)

Acute WLA multiplier

107 (default = 2 or 1:1 mixing)

Human health WLA multiplier

107 (default = 51 or 50:1 mixing)

90th % stream pH

8.38

10th % stream pH

90th % stream temp

27.82 (°C)

mean effluent hardness

mean stream hardness

(note: 25 mg/l minimum)

mean stream salinity

17.05 (g/kg)

Parameter (ug/l unless noted)	Background Conc.	Water Quality Standard			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Acenaphthene	0			2.7E+03			2.9E+05			2.7E+03			2.9E+05			2.9E+05
Aldrin ^c	0	1.3E+00	1.3E-01	1.4E-03	1.4E+02	1.4E+01	1.5E-01	1.3E+00	1.3E-01	1.4E-03	1.4E+02	1.4E+01	1.5E-01	1.4E+02	1.4E+01	1.5E-01
Ammonia-N (mg/l)	0	1.4E+00	2.1E-01		1.5E+02	2.2E+01		1.4E+00	2.1E-01		1.5E+02	2.2E+01		1.5E+02	2.2E+01	
Anthracene	0			1.1E+05			1.2E+07			1.1E+05			1.2E+07			1.2E+07
Antimony	0			4.3E+03			4.6E+05			4.3E+03			4.6E+05			4.6E+05
Arsenic III	0	6.9E+01	3.6E+01		7.4E+03	3.9E+03		6.9E+01	3.6E+01		7.4E+03	3.9E+03		7.4E+03	3.9E+03	
Benzene ^c	0			7.1E+02			7.6E+04			7.1E+02			7.6E+04			7.6E+04
Benzo(a)anthracene ^c	0			4.9E-01			5.2E+01			4.9E-01			5.2E+01			5.2E+01
Benzo(b)fluoranthene ^c	0			4.9E-01			5.2E+01			4.9E-01			5.2E+01			5.2E+01
Benzo(k)fluoranthene ^c	0			4.9E-01			5.2E+01			4.9E-01			5.2E+01			5.2E+01
Benzo(a)pyrene ^c	0			4.9E-01			5.2E+01			4.9E-01			5.2E+01			5.2E+01
Bromoform ^c	0			3.6E+03			3.9E+05			3.6E+03			3.9E+05			3.9E+05
Butylbenzylphthalate	0			5.2E+03			5.6E+05			5.2E+03			5.6E+05			5.6E+05
Cadmium	0	4.3E+01	9.3E+00		4.6E+03	1.0E+03		4.3E+01	9.3E+00		4.6E+03	1.0E+03		4.6E+03	1.0E+03	
Carbon Tetrachloride ^c	0			4.5E+01			4.8E+03			4.5E+01			4.8E+03			4.8E+03
Chlordane ^c	0	9.0E-02	4.0E-03	5.9E-03	9.6E+00	4.3E-01	6.3E-01	9.0E-02	4.0E-03	5.9E-03	9.6E+00	4.3E-01	6.3E-01	9.6E+00	4.3E-01	6.3E-01
Chloride	0													0.0E+00	0.0E+00	
TRC	0													0.0E+00	0.0E+00	
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00		1.4E+03	8.0E+02		1.3E+01	7.5E+00		1.4E+03	8.0E+02		1.4E+03	8.0E+02	
Chlorodibromomethane	0			5.7E+04			6.1E+06			5.7E+04			6.1E+06			6.1E+06
Chloroform ^c	0			4.7E+03			5.0E+05			4.7E+03			5.0E+05			5.0E+05
2-Chlorophenol	0			4.0E+02			4.3E+04			4.0E+02			4.3E+04			4.3E+04
Chlorpyrifos	0	1.1E-02	5.6E-03		1.2E+00	6.0E-01		1.1E-02	5.6E-03		1.2E+00	6.0E-01		1.2E+00	6.0E-01	

Mosca,Denise

From: Phillips,Dale <mdphillips@deq.state.va.us>
Sent: Tuesday, March 05, 2002 1:02 PM
To: DMMosca
Subject: RE: Cormix



OVERFLOW.TXT



BEYOND.RTF

- The message text was too large.
- The entire text of the message can be found in the Overflow.txt attachment.

I calculated the average differently than Jon (did not include the slack tide run). Bill suggested the diffuser changes to get the velocity down a little and the more appropriate average (include the slack tide run).

Dale.

> -----Original Message-----

> From: Mosca,Denise

> Sent: Tuesday, March 05, 2002 8:01 AM

> To: Phillips,Dale

> Subject: RE: Cormix

>

> So the refinements were not as beneficial as was hoped, the dilution ratio is

> smaller with this arrangement (106:1 vs. 158:1). Why is that?

> denise

>

> Denise M. Mosca

> Environmental Engineer Sr.

> DEQ-Kilmarnock Satellite Office

> P.O. Box 669

> Kilmarnock, Va. 22482

> 804-435-3181 telephone

> 804-435-0485 fax

> ----- Original Text -----

>

> From: "Phillips,Dale" <mdphillips@deq.state.va.us>, on 3/5/2002 7:57 AM:

>

>

> -- The message text was too large.

> -- The entire text of the message can be found in the Overflow.txt attachment.

>

> Denise,

>

> The diffuser has been somewhat redesigned and the new dilution is as recommended. Nothing else in the model was changed. I suggest the use

> 106:1

> for calculating permit limits.

>

> Dale.

>

> > -----Original Message-----

> > From: Mosca,Denise

> > Sent: Tuesday, March 05, 2002 7:19 AM

> > To: Phillips,Dale

> > Subject: fwd: Cormix

> >

> > Hi Dale--
> > here the refinements Omega's consultant talked about for the diffuser.
> Would
> > you please look at them and advise if there are any changes to the
dilution
> > ratio you recommended last week?
> > thanks,
> > denise
> >
> > Denise M. Mosca
> > Environmental Engineer Sr.
> > DEQ-Kilmarnock Satellite Office
> > P.O. Box 669
> > Kilmarnock, Va. 22482
> > 804-435-3181 telephone
> > 804-435-0485 fax
> > ----- Original Text -----
> >
> > From: "Bill Black" <bilenpro@swbell.net>, on 3/4/2002 10:37 AM:
> > To: Denise M. Mosca@KLMCK@DEQ
> >
> > Hi Denise, before you use that dilution ratio in Dale's email of last
> > week, I just talked to him about some port changes. After receiving his
> > reply of last week, I analyzed port openings, number of ports and water
> > pressures and realized I needed some larger openings. Therefore, I have
> > attached the revised Cormix runs for Dale's review. He said for you to
> > send them on to him and he could provide a quick turn around.
> >
> > The only changes from the previous runs that Dale reviewed are: Number
> > of ports and port diameters. I now have 22 ports at 4 inches diameter.
> > When the three conditions are averaged (at slack, one hour before slack
> > and one hour after slack) the new diffusion will be 106:1 subject to
> > Dale's review.
> >
> > Bill
> >
> >
> >
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> xmlns:w="urn:schemas-microsoft-com:office:word"
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> > <meta name=Originator content="Microsoft Word 10">
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>> font-family:Arial;
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>> mso-bidi-font-family:"Times New Roman";}
>> h1
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> > mso-bidi-font-family:Arial'>Hi Denise, before you use that dilution ratio
in
> > Dale's email of last week, I just talked to him about some port
> > changes. After
> > receiving his reply of last week, I analyzed port openings, number of
ports
> > and
> > water pressures and realized I needed some larger openings. Therefore, I
have
> > attached the revised Cormix runs for Dale's review.<span
> > style='mso-spacerun:yes'>&nbsp;</span>He said for you to send them on to
him
> > and he could provide a quick turn around.<o:p></o:p></span></font></p>
> >
> > <p class=MsoNormal><font size=2 face=Arial><span style='font-size:10.0pt;
> > mso-bidi-font-family:Arial'><o:p>&nbsp;</o:p></span></font></p>
> >
> > <p class=MsoNormal><font size=2 face=Arial><span style='font-size:10.0pt;
> > mso-bidi-font-family:Arial'>The only changes from the previous runs that
Dale
> > reviewed are:<span style='mso-spacerun:yes'>&nbsp;</span>Number of ports
and
> > port diameters.<span style='mso-spacerun:yes'>&nbsp;</span>I now have 22
> > ports
> > at 4 inches diameter.<span style='mso-spacerun:yes'>&nbsp;</span>When the
> > three conditions are averaged (at slack, one hour before slack and one hour
> > after slack) the new diffusion will be 106:1 subject to Dale's
> > review.<o:p></o:p></span></font></p>
> >
> > <p class=MsoNormal><font size=2 face=Arial><span style='font-size:10.0pt;

```

[illegible]

[illegible]

```

>
-----
>
>>
>
-----
>
>> BEGIN MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING
> DIFFUSER
>>
>> In this laterally contracting zone the diffuser plume becomes VERTICALLY
> FULLY
>> MIXED over the entire layer depth (HS = 5.00m).
>> Full mixing is achieved after a plume distance of about five
>> layer depths from the diffuser.
>>
>> Profile definitions:
>> BV = layer depth (vertically mixed)>
>> BH = top-hat half-width, in horizontal plane normal to trajectory
>> S = hydrodynamic average (bulk) dilution
>> C = average (bulk) concentration (includes reaction effects, if any)
>>
>>   X    Y    Z    S    C    BV    BH
>>   .00   .00  .25   1.0  .400E+02 .00  27.50
>>   1.10   .00  .34  32.2  .124E+01 .22  27.40
>>   2.20   .00  .43  44.8  .893E+00 .44  27.32
>>   3.30   .00  .52  54.3  .736E+00 .66  27.24
>>   4.40   .00  .61  62.2  .643E+00 .88  27.17
>>   5.50   .00  .70  69.1  .579E+00 1.10  27.11
>>   6.60   .00  .79  75.2  .532E+00 1.32  27.06
>>   7.70   .00  .88  80.7  .496E+00 1.54  27.01
>>   8.80   .00  .97  85.7  .467E+00 1.76  26.96
>>   9.90   .00  1.06  90.4  .443E+00 1.98  26.92
>>  11.00   .00  1.15  94.7  .422E+00 2.20  26.89
>>  12.10   .00  1.24  98.8  .405E+00 2.42  26.85
>>  13.20   .00  1.33 102.6  .390E+00 2.64  26.82
>>  14.30   .00  1.42 106.2  .377E+00 2.86  26.79
>>  15.40   .00  1.51 109.6  .365E+00 3.08  26.77
>>  16.50   .00  1.60 112.9  .354E+00 3.30  26.74
>>  17.60   .00  1.69 116.0  .345E+00 3.52  26.72
>>  18.70   .00  1.78 119.0  .336E+00 3.74  26.71
>>  19.80   .00  1.87 121.8  .328E+00 3.96  26.69
>>  20.90   .00  1.96 124.5  .321E+00 4.18  26.68
>>  22.00   .00  2.05 127.2  .315E+00 4.40  26.67
>>  23.10   .00  2.14 129.7  .308E+00 4.62  26.66
>>  24.20   .00  2.23 132.1  .303E+00 4.84  26.66
>>  25.30   .00  2.32 134.5  .297E+00 5.00  26.66
>>  26.40   .00  2.41 136.8  .292E+00 5.00  26.65
>>  27.50   .00  2.50 139.0  .288E+00 5.00  26.65
>> Cumulative travel time = 258. sec
>>
>> END OF MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING
> DIFFUSER
>>
>
-----
>
>
>> BEGIN MOD251: DIFFUSER PLUME IN
> CO-FLOW

```

```

>>
>> Phase 1: Vertically mixed, Phase 2: Re-stratified
>>
>>
>
-----
>
>> Phase 2: The flow has RESTRATIFIED at the beginning of this zone.
>>
>> This flow region is INSIGNIFICANT in spatial extent and will be by-passed.
>>
>> END OF MOD251: DIFFUSER PLUME IN
> CO-FLOW
>>
>
-----
>
>> ** End of NEAR-FIELD REGION (NFR) **
>>
>> The initial plume WIDTH values in the next far-field module will be
>> CORRECTED by a factor 1.07 to conserve the mass flux in the far-field!
>>
>
-----
>
>> BEGIN MOD241: BUOYANT AMBIENT
> SPREADING
>>
>> Profile definitions:
>> BV = top-hat thickness, measured vertically
>> BH = top-hat half-width, measured horizontally in y-direction
>> ZU = upper plume boundary (Z-coordinate)
>> ZL = lower plume boundary (Z-coordinate)
>> S = hydrodynamic average (bulk) dilution
>> C = average (bulk) concentration (includes reaction effects, if any)
>>
>> Plume Stage 1 (not bank attached):
>>   X    Y    Z    S    C    BV    BH    ZU
ZL
>> 27.50  .00  5.00 139.0 .288E+00 5.00 28.39 5.00
.00
>> 31.85  .00  5.00 138.7 .288E+00 4.83 29.80 5.00
.17
>> 36.19  .00  5.00 138.5 .289E+00 4.68 31.18 5.00
.32
>> 40.54  .00  5.00 138.3 .289E+00 4.55 32.53 5.00
> .45>
>> 44.88  .00  5.00 138.1 .290E+00 4.42 33.85 5.00
.58
>> 49.23  .00  5.00 138.0 .290E+00 4.31 35.15 5.00
.69
>> 53.57  .00  5.00 137.9 .290E+00 4.21 36.42 5.00
.79
>> 57.92  .00  5.00 137.9 .290E+00 4.12 37.67 5.00
.88
>> 62.26  .00  5.00 137.9 .290E+00 4.04 38.90 5.00
.96
>> 66.61  .00  5.00 138.0 .290E+00 3.96 40.11 5.00
1.04
>> 70.95  .00  5.00 138.1 .290E+00 3.89 41.30 5.00
1.11
>> 75.30  .00  5.00 138.3 .289E+00 3.82 42.48 5.00
1.18
>> 79.64  .00  5.00 138.5 .289E+00 3.76 43.64 5.00

```

```

1.24
>> 83.99 .00 5.00 138.8 .288E+00 3.70 44.78 5.00
1.30
>> 88.33 .00 5.00 139.2 .287E+00 3.65 45.91 5.00
1.35
>> 92.68 .00 5.00 139.6 .287E+00 3.60 47.02 5.00
1.40
>> 97.02 .00 5.00 140.0 .286E+00 3.56 48.12 5.00
1.44
>> 101.37 .00 5.00 140.5 .285E+00 3.52 49.21 5.00
1.48
>> 105.71 .00 5.00 141.1 .284E+00 3.48 50.29 5.00
1.52
>> 110.06 .00 5.00 141.7 .282E+00 3.44 51.35 5.00
1.56
>> 114.40 .00 5.00 142.3 .281E+00 3.41 52.41 5.00
1.59
>> 118.75 .00 5.00 143.0 .280E+00 3.38 53.45 5.00
1.62
>> 123.09 .00 5.00 143.8 .278E+00 3.35 54.49 5.00
1.65
>> 127.44 .00 5.00 144.6 .277E+00 3.32 55.51 5.00
1.68
>> 131.78 .00 5.00 145.5 .275E+00 3.30 56.52 5.00
1.70
>> 136.13 .00 5.00 146.4 .273E+00 3.28 57.53 5.00
1.72
>> Cumulative travel time = 1344. sec
>>
>>
>

```

>
> > Plume is ATTACHED to LEFT bank/shore.
> > Plume width is now determined from LEFT bank/shore.

```
>>
>> Plume Stage 2 (bank attached):
>>   X   Y   Z   S   C   BV   BH   ZU
```

```
ZL>
>> 136.13 57.50 5.00 144.9 .276E+00 3.28 115.00 5.00
1.72
```

```
>> 145.41 57.50 5.00 146.6 .273E+00 3.28 117.10 5.00
1.72
>> Cumulative travel time = 1436. sec
```

```
> > CORMIX prediction has been TERMINATED at last prediction interval.
> > Limiting distance due to TIDAL REVERSAL has been
reached.
```

```
>>
>> END OF MOD241: BUOYANT AMBIENT
> SPREADING
```

> >
 >

$$\begin{array}{c} \vee \\ \vee \quad \vee \\ \vee \end{array}$$

>
> > CORMIX2: Submerged Multiport Diffuser Discharges End of Prediction
File

[illegible]


```
> > 2222222222222222222222222222222222222222222222222222222
> > 2 Flow class (CORMIX2) = MU2 2
> > 2 Applicable layer depth HS = 5.00 2
> > 2222222222222222222222222222222222222222222222222222222
> >
> > MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS>
> > C0 = .4000E+02 CUNITS= degC
> > NTOX = 0
> > NSTD = 0
> > REGMZ = 0
> > XINT = 6600.00 XMAX = 6600.00
> >
> > X-Y-Z COORDINATE SYSTEM:
> > ORIGIN is located at the bottom and the diffuser mid-point:
> > 57.50 m from the LEFT bank/shore.
> > X-axis points downstream, Y-axis points to left, Z-axis points upward.
> > NSTEP = 25 display intervals per module
> >
> > NOTE on dilution/concentration values for this HEATED DISCHARGE (IPOLL=3):
> > S = hydrodynamic dilutions, include buoyancy (heat) loss effects, but
> > provided plume has surface contact
> > C = corresponding temperature values (always in "degC!"),
> > include heat loss, if any
> >
> >
> > -----
> >
> > -----
> >
> > BEGIN MOD201: DIFFUSER DISCHARGE
> > MODULE
> >
> > Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D)
GEOMETRY
> >
> > Profile definitions:
> > BV = Gaussian 1/e (37%) half-width, in vertical plane normal to
trajectory
> > BH = top-hat half-width, in horizontal plane normal to trajectory
> > S = hydrodynamic centerline dilution
> > C = centerline concentration (includes reaction effects, if any)
> >
> > X Y Z S C BV BH
> > .00 .00 .25 1.0 .400E+02 .00 27.50
> >
> > END OF MOD201: DIFFUSER DISCHARGE
> > MODULE
> >
> > -----
> >
> > -----
> >
> > BEGIN MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING
> > DIFFUSER
> >
> > In this laterally contracting zone the diffuser plume becomes VERTICALLY
> > FULLY
> > MIXED over the entire layer depth (HS = 5.00m).
> > Full mixing is achieved after a plume distance of about five>
```

>> layer depths from the diffuser.

>>

>> Profile definitions:

>> BV = layer depth (vertically mixed)

>> BH = top-hat half-width, in horizontal plane normal to trajectory

>> S = hydrodynamic average (bulk) dilution

>> C = average (bulk) concentration (includes reaction effects, if any)

>>

X	Y	Z	S	C	BV	BH
.00	.00	.25	1.0	.400E+02	.00	27.50
1.10	.00	.34	32.3	.124E+01	.22	27.40
2.20	.00	.43	45.3	.884E+00	.44	27.32
3.30	.00	.52	55.2	.725E+00	.66	27.24
4.40	.00	.61	63.5	.630E+00	.88	27.17
5.50	.00	.70	70.8	.565E+00	1.10	27.11
6.60	.00	.79	77.4	.517E+00	1.32	27.06
7.70	.00	.88	83.4	.480E+00	1.54	27.01
8.80	.00	.97	89.0	.449E+00	1.76	26.96
9.90	.00	1.06	94.3	.424E+00	1.98	26.92
11.00	.00	1.15	99.2	.403E+00	2.20	26.89
12.10	.00	1.24	103.9	.385E+00	2.42	26.85
13.20	.00	1.33	108.4	.369E+00	2.64	26.82
14.30	.00	1.42	112.7	.355E+00	2.86	26.79
15.40	.00	1.51	116.8	.342E+00	3.08	26.77
16.50	.00	1.60	120.8	.331E+00	3.30	26.74
17.60	.00	1.69	124.6	.321E+00	3.52	26.72
18.70	.00	1.78	128.3	.312E+00	3.74	26.71
19.80	.00	1.87	131.9	.303E+00	3.96	26.69
20.90	.00	1.96	135.4	.295E+00	4.18	26.68
22.00	.00	2.05	138.8	.288E+00	4.40	26.67
23.10	.00	2.14	142.1	.282E+00	4.62	26.66
24.20	.00	2.23	145.3	.275E+00	4.84	26.66
25.30	.00	2.32	148.4	.270E+00	5.00	26.66
26.40	.00	2.41	151.4	.264E+00	5.00	26.65
27.50	.00	2.50	154.4	.259E+00	5.00	26.65

>> Cumulative travel time = 258. sec

>>

>> END OF MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING

> DIFFUSER

>>

>

>

>>

>

>

>

>

>> BEGIN MOD251: DIFFUSER PLUME IN

> CO-FLOW

>>

>> Phase 1: Vertically mixed, Phase 2: Re-stratified

>>

>>

>

>

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>>

>>

>>

>>

>>

>>

>

>

2007/05/01 - 2007/05/01

```
> > Profile definitions:
> > BV = top-hat thickness, measured vertically
> > BH = top-hat half-width, measured horizontally in y-direction
> > ZU = upper plume boundary (Z-coordinate)
> > ZL = lower plume boundary (Z-coordinate)
> > S = hydrodynamic average (bulk) dilution
> > C = average (bulk) concentration (includes reaction effects, if any)
```

	X	Y	Z	S	C	BV	BH	ZU
27.50	.00	5.00	154.4	.259E+00	5.00	28.39	5.00	
31.85	.00	5.00	156.2	.256E+00	4.83	29.80	5.00	
36.19	.00	5.00	157.9	.253E+00	4.68	31.18	5.00	
40.54	.00	5.00	159.5	.251E+00	4.55	32.53	5.00	
44.88	.00	5.00	161.2	.248E+00	4.42	33.85	5.00	
49.23	.00	5.00	162.7	.246E+00	4.31	35.15	5.00	
53.57	.00	5.00	164.3	.243E+00	4.21	36.42	5.00	
57.92	.00	5.00	165.8	.241E+00	4.12	37.67	5.00	
62.26	.00	5.00	167.4	.239E+00	4.04	38.90	5.00	
66.61	.00	5.00	168.9	.237E+00	3.96	40.11	5.00	
70.95	.00	5.00	170.5	.235E+00	3.89	41.30	5.00	
75.30	.00	5.00	172.0	.233E+00	3.82	42.48	5.00	
79.64	.00	5.00	173.6	.230E+00	3.76	43.64	5.00	
83.99	.00	5.00	175.1	.228E+00	3.70	44.78	5.00	
88.33	.00	5.00	176.7	.226E+00	3.65	45.91	5.00	
92.68	.00	5.00	178.3	.224E+00	3.60	47.02	5.00	
97.02	.00	5.00	179.9	.222E+00	3.56	48.12	5.00	
101.37	.00	5.00	181.6	.220E+00	3.52	49.21	5.00	
105.71	.00	5.00	183.3	.218E+00	3.48	50.29	5.00	
110.06	.00	5.00	185.0	.216E+00	3.44	51.35	5.00	

```

>> 114.40 .00 5.00 186.7 .214E+00 3.41 52.41 5.00
1.59
>> 118.75 .00 5.00 188.5 .212E+00 3.38 53.45 5.00
1.62
>> 123.09 .00 5.00 190.3 .210E+00 3.35 54.49 5.00
1.65>
>> 127.44 .00 5.00 192.1 .208E+00 3.32 55.51 5.00
1.68
>> 131.78 .00 5.00 193.9 .206E+00 3.30 56.52 5.00
1.70
>> 136.13 .00 5.00 195.8 .204E+00 3.28 57.53 5.00
1.72
>> Cumulative travel time = 1344. sec
>>
>>
>
-----
>
>> Plume is ATTACHED to LEFT bank/shore.
>> Plume width is now determined from LEFT bank/shore.
>>
>> Plume Stage 2 (bank attached):
>> X Y Z S C BV BH ZU
ZL
>> 136.13 57.50 5.00 195.4 .205E+00 3.28 115.00 5.00
1.72
>> 156.21 57.50 5.00 202.7 .197E+00 3.28 119.55 5.00
1.72
>> 176.29 57.50 5.00 210.5 .190E+00 3.29 124.02 5.00
1.71
>> 196.37 57.50 5.00 219.0 .183E+00 3.31 128.40 5.00
1.69
>> 198.30 57.50 5.00 219.8n

```

Parameter (ug/l unless noted)	Background Conc.	Water Quality Standard			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Chromium III	0													0.0E+00	0.0E+00	
Chromium VI	0	1.1E+03	5.0E+01		1.2E+05	5.4E+03		1.1E+03	5.0E+01		1.2E+05	5.4E+03		1.2E+05	5.4E+03	
Chrysene ^c	0			4.9E-01			5.2E+01			4.9E-01			5.2E+01			5.2E+01
Copper	0	5.9E+00	3.8E+00		6.3E+02	4.1E+02		5.9E+00	3.8E+00		6.3E+02	4.1E+02		6.3E+02	4.1E+02	
Cyanide	0	1.0E+00	1.0E+00	2.2E+05	1.1E+02	1.1E+02	2.3E+07	1.0E+00	1.0E+00	2.2E+05	1.1E+02	1.1E+02	2.3E+07	1.1E+02	1.1E+02	2.3E+07
DDD ^c	0			8.4E-03			9.0E-01			8.4E-03			9.0E-01			9.0E-01
DDE ^c	0			5.9E-03			6.3E-01			5.9E-03			6.3E-01			6.3E-01
DDT ^c	0	1.3E-01	1.0E-03	5.9E-03	1.4E+01	1.1E-01	6.3E-01	1.3E-01	1.0E-03	5.9E-03	1.4E+01	1.1E-01	6.3E-01	1.4E+01	1.1E-01	6.3E-01
Demeton	0		1.0E-01			1.1E+01			1.0E-01			1.1E+01			1.1E+01	
Dibenz(a,h)anthracene ^c	0			4.9E-01			5.2E+01			4.9E-01			5.2E+01			5.2E+01
Dibutylphthalate	0			1.2E+04			1.3E+06			1.2E+04			1.3E+06			1.3E+06
Dichloromethane ^c	0			1.6E+04			1.7E+06			1.6E+04			1.7E+06			1.7E+06
1,2-Dichlorobenzene	0			1.7E+04			1.8E+06			1.7E+04			1.8E+06			1.8E+06
1,3-Dichlorobenzene	0			2.6E+03			2.8E+05			2.6E+03			2.8E+05			2.8E+05
1,4-Dichlorobenzene	0			2.6E+03			2.8E+05			2.6E+03			2.8E+05			2.8E+05
Dichlorobromomethane ^c	0			4.6E+02			4.9E+04			4.6E+02			4.9E+04			4.9E+04
1,2-Dichloroethane ^c	0			9.9E+02			1.1E+05			9.9E+02			1.1E+05			1.1E+05
1,1-Dichloroethylene	0			1.7E+04			1.8E+06			1.7E+04			1.8E+06			1.8E+06
2,4-Dichlorophenol	0			7.9E+02			8.5E+04			7.9E+02			8.5E+04			8.5E+04
Dieldrin ^c	0	7.1E-01	1.9E-03	1.4E-03	7.6E+01	2.0E-01	1.5E-01	7.1E-01	1.9E-03	1.4E-03	7.6E+01	2.0E-01	1.5E-01	7.6E+01	2.0E-01	1.5E-01
Diethylphthalate	0			1.2E+05			1.3E+07			1.2E+05			1.3E+07			1.3E+07
Di-2-ethylhexylphthalate ^c	0			5.9E+01			6.3E+03			5.9E+01			6.3E+03			6.3E+03
2,4-Dimethylphenol	0			2.3E+03			2.5E+05			2.3E+03			2.5E+05			2.5E+05
2,4-Dinitrotoluene ^c	0			9.1E+01			9.7E+03			9.1E+01			9.7E+03			9.7E+03
Dioxin (ppq)	0			1.2E-06			1.3E-04			1.2E-06			1.3E-04			1.3E-04
Endosulfan	0	3.4E-02	8.7E-03	2.4E+02	3.6E+00	9.3E-01	2.6E+04	3.4E-02	8.7E-03	2.4E+02	3.6E+00	9.3E-01	2.6E+04	3.6E+00	9.3E-01	2.6E+04
Endrin	0	3.7E-02	2.3E-03	8.1E-01	4.0E+00	2.5E-01	8.7E+01	3.7E-02	2.3E-03	8.1E-01	4.0E+00	2.5E-01	8.7E+01	4.0E+00	2.5E-01	8.7E+01
Ethylbenzene	0			2.9E+04			3.1E+06			2.9E+04			3.1E+06			3.1E+06
Fluoranthene	0			3.7E+02			4.0E+04			3.7E+02			4.0E+04			4.0E+04
Fluorene	0			1.4E+04			1.5E+06			1.4E+04			1.5E+06			1.5E+06

Parameter (ug/l unless noted)	Background Conc.	Water Quality Standard			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Guthion	0		1.0E-02			1.1E+00			1.0E-02			1.1E+00			1.1E+00	
Heptachlor ^C	0	5.3E-02	3.6E-03	2.1E-03	5.7E+00	3.9E-01	2.2E-01	5.3E-02	3.6E-03	2.1E-03	5.7E+00	3.9E-01	2.2E-01	5.7E+00	3.9E-01	2.2E-01
Hexachlorocyclohexane (Lindane)	0	1.6E-01	1.0E-02	2.5E+01	1.7E+01	1.1E+00	2.7E+03	1.6E-01	1.0E-02	2.5E+01	1.7E+01	1.1E+00	2.7E+03	1.7E+01	1.1E+00	2.7E+03
Hydrogen Sulfide	0		2.0E+00			2.1E+02			2.0E+00			2.1E+02			2.1E+02	
Indeno(1,2,3-cd)pyrene C	0			4.9E-01			5.2E+01			4.9E-01			5.2E+01			5.2E+01
Isophorone	0			4.9E+05			5.2E+07			4.9E+05			5.2E+07			5.2E+07
Kepone	0		0.0E+00			0.0E+00			0.0E+00			0.0E+00			0.0E+00	
Lead	0	2.4E+02	9.3E+00		2.6E+04	1.0E+03		2.4E+02	9.3E+00		2.6E+04	1.0E+03		2.6E+04	1.0E+03	
Malathion	0		1.0E-01			1.1E+01			1.0E-01			1.1E+01			1.1E+01	
Mercury	0	2.1E+00	2.5E-02	5.3E-02	2.2E+02	2.7E+00	5.7E+00	2.1E+00	2.5E-02	5.3E-02	2.2E+02	2.7E+00	5.7E+00	2.2E+02	2.7E+00	5.7E+00
Methoxychlor	0		3.0E-02			3.2E+00			3.0E-02			3.2E+00			3.2E+00	
Mirex	0		0.0E+00			0.0E+00			0.0E+00			0.0E+00			0.0E+00	
Monochlorobenzene	0			2.1E+04			2.2E+06			2.1E+04			2.2E+06			2.2E+06
Nickel	0	7.5E+01	8.3E+00	4.6E+03	8.0E+03	8.9E+02	4.9E+05	7.5E+01	8.3E+00	4.6E+03	8.0E+03	8.9E+02	4.9E+05	8.0E+03	8.9E+02	4.9E+05
Nitrobenzene	0			1.9E+03			2.0E+05			1.9E+03			2.0E+05			2.0E+05
Parathion	0										0.0E+00	0.0E+00		0.0E+00	0.0E+00	
PCB-1016 ^C	0		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.2E+00	4.8E-02
PCB-1221 ^C	0		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.2E+00	4.8E-02
PCB-1232 ^C	0		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.2E+00	4.8E-02
PCB-1242 ^C	0		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.2E+00	4.8E-02
PCB-1248 ^C	0		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.2E+00	4.8E-02
PCB-1254 ^C	0		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.2E+00	4.8E-02
PCB-1260 ^C	0		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.0E-02	4.5E-04		3.2E+00	4.8E-02		3.2E+00	4.8E-02
Pentachlorophenol ^C	0	1.3E+01	7.9E+00	8.2E+01	1.4E+03	8.5E+02	8.8E+03	1.3E+01	7.9E+00	8.2E+01	1.4E+03	8.5E+02	8.8E+03	1.4E+03	8.5E+02	8.8E+03
Phenol	0			4.6E+06			4.9E+08			4.6E+06			4.9E+08			4.9E+08
Phosphorus (Elemental)	0		0.1			1.1E+01			1.0E-01			1.1E+01				
Pyrene	0			1.1E+04			1.2E+06			1.1E+04			1.2E+06			1.2E+06

Parameter (ug/l unless noted)	Background Conc.	Water Quality Standard			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Radionuclides (pCi/l except Beta/Photon)	0															
Gross Alpha Activity	0			1.5E+01			1.6E+03			1.5E+01			1.6E+03			1.6E+03
Beta and Photon Activity	0			4.0E+00			4.3E+02			4.0E+00			4.3E+02			4.3E+02
Strontium-90	0			8.0E+00			8.6E+02			8.0E+00			8.6E+02			8.6E+02
Tritium	0			2.0E+04			2.1E+06			2.0E+04			2.1E+06			2.1E+06
Selenium	0	3.0E+02	7.1E+01	1.1E+04	3.2E+04	7.6E+03	1.2E+06	3.0E+02	7.1E+01	1.1E+04	3.2E+04	7.6E+03	1.2E+06	3.2E+04	7.6E+03	1.2E+06
Silver	0	2.3E+00			2.5E+02			2.3E+00			2.5E+02			2.5E+02		
Tetrachloroethylene	0			3.5E+03			3.7E+05			3.5E+03			3.7E+05			3.7E+05
Toluene	0			2.0E+05			2.1E+07			2.0E+05			2.1E+07			2.1E+07
Toxaphene ^C	0	2.1E-01	2.0E-04	7.3E-03	2.2E+01	2.1E-02	7.8E-01	2.1E-01	2.0E-04	7.3E-03	2.2E+01	2.1E-02	7.8E-01	2.2E+01	2.1E-02	7.8E-01
1,2,4-Trichlorobenzene	0			9.5E+02			1.0E+05			9.5E+02			1.0E+05			1.0E+05
Trichloroethylene ^C	0			8.1E+02			8.7E+04			8.1E+02			8.7E+04			8.7E+04
2,4,6-Trichlorophenol ^C	0			6.5E+01			7.0E+03			6.5E+01			7.0E+03			7.0E+03
Tributyltin	0	3.6E-01	1.0E-03		3.9E+01	1.1E-01		3.6E-01	1.0E-03		3.9E+01	1.1E-01		3.9E+01	1.1E-01	
Vinyl Chloride	0			5.3E+03			5.7E+05			5.3E+03			5.7E+05			5.7E+05
Zinc	0	9.5E+01	8.6E+01		1.0E+04	9.2E+03		9.5E+01	8.6E+01		1.0E+04	9.2E+03		1.0E+04	9.2E+03	

^C = carcinogenic

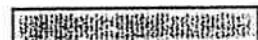
For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality standards.

Regular WLA = (WQS x WLA multiplier) - (WLA multiplier - 1)(background conc.)

Antideg. Baseline = (0.25(WQS - background conc.) + background conc.) for acute and chronic

= (0.1(WQS - background conc.) + background conc.) for human health

Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)



= data entry cells



= protected cells

Site Specific	
Metal	Target Value (SSTV)
Antimony	4.6E+05
Arsenic III	2.3E+03
Cadmium	6.0E+02
Chromium III	0.0E+00
Chromium VI	3.2E+03
Copper	2.4E+02
Lead	6.0E+02
Mercury	1.6E+00
Nickel	5.3E+02
Selenium	4.6E+03
Silver	9.8E+01
Zinc	4.1E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Freshwater Ammonia Criteria			
	unionized	total	NH3-N
Acute	0.446245	3.129441	2.5724
Chronic	0.101708	0.713263	0.5863

Ammonia Calculations - Saltwater										
							Acute	Chronic	Acute	Chronic
Salinity	Temp (C)	pH	I	pKa(25)	pKa(T)	UIA	Total NH3	Total NH3	NH3-N	NH3-N
17.05	27.8	8.38	0.345684	9.27	9.17377	0.138509	1.68	0.25	1.38	0.21

Acute hardness	0.00
Chronic Hardness	0.00

12/30/02 4:37:54 PM

Facility = Omega 001
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 150
WLAc = 22
Q.L. = 0.2
samples/mo. = 2
samples/wk. = 1

Summary of Statistics:

observations = 23
Expected Value = 13.7886
Variance = 302.388
C.V. = 1.261130
97th percentile daily values = 53.6816
97th percentile 4 day average = 34.6324
97th percentile 30 day average = 19.7605
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

17.1
33.1
13.2
21.3
0.99
0.99
8.8
14.4
6.16
12
47
15.4
7.28
4.76
3.07
2.38
4.86
17.7
7.56
13.4
11.8
7
14.8

2/14/03 2:14:48 PM

Facility = Omega 001
Chemical = Cyanide
Chronic averaging period = 4
WLAa = 110
WLAc = 110
Q.L. = 5
samples/mo. = 2
samples/wk. = 1

Summary of Statistics:

observations = 27
Expected Value = 344.763
Variance = 1589240
C.V. = 3.656567
97th percentile daily values = 2102.65
97th percentile 4 day average = 1616.55
97th percentile 30 day average = 777.698
< Q.L. = 2
Model used = delta lognormal

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 110
Average Weekly limit = 110
Average Monthly Limit = 95.9136160182705 rounded to 96

The data are:

30
90
120
170
299
205
48
14
59
5
0 < 5
10
19
9
89
70
48
198
75
341

2094
2614
1135
263

0 45

2/5/03 4:59:26 PM

Facility = Omega 001
Chemical = Copper
Chronic averaging period = 4
WLAa = 630
WLAc = 410
Q.L. = 41
samples/mo. = 2
samples/wk. = 1

Summary of Statistics:

observations = 10
Expected Value = 62.8836
Variance = 196.967
C.V. = 0.223182
97th percentile daily values = 92.9159
97th percentile 4 day average = 77.0420
97th percentile 30 day average = 67.7033
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

68
53
59
62
66
68
74
48
41
88

2/5/03 4:01:49 PM

Facility = Omega 001
Chemical = Silver
Chronic averaging period = 4
WLAa = 250
WLAc =
Q.L. = 2.07
samples/mo. = 2
samples/wk. = 1

Summary of Statistics:

observations = 10
Expected Value = 4.94034
Variance = 18.7430
C.V. = 0.876320
97th percentile daily values = 15.3700
97th percentile 4 day average = 9.95321
97th percentile 30 day average = 6.42712
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

3.2
2.68
3.17
2.69
2.41
2.07
2.77
2.95
6.23
27

1/7/03 11:17:23 AM

Facility = Omega 001
Chemical = Chlorine
Chronic averaging period = 4
WLAa = 1400
WLAc = 800
Q.L. = 100
samples/mo. = 30
samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 1000
Variance = 360000
C.V. = 0.6
97th percentile daily values = 2433.41
97th percentile 4 day average = 1663.79
97th percentile 30 day average = 1206.05
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 1170.05982724258 rounded to 1200
Average Weekly limit = 697.946637760077
Average Monthly Limit = 579.906413372785 rounded to 580

The data are:

1000

Water Quality Standards and Wasteload Allocations for Saltwater and Transition Zones

Permittee:
Permit No.
Receiving Stream:
WQ Tier
Tidal Zone

Omega Protein 002
VA0003867
Cockrell Creek
1 (1 or 2)
1 (1 = saltwater
2 = transition zone)

Design Flow (MGD)
Chronic WLA multiplier
Acute WLA multiplier
Human health WLA multiplier

0.25
101 (default = 51 or 50:1 mixing)
101 (default = 2 or 1:1 mixing)
101 (default = 51 or 50:1 mixing)

90th % stream pH
10th % stream pH
90th % stream temp
mean effluent hardness
mean stream hardness
mean stream salinity

8.38
27.82 (° C)
25 (note: 25 mg/l minimum)
17.05 (g/kg)

Parameter (ug/l unless noted)	Background Conc.	Water Quality Standard			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Acenaphthene	0			2.7E+03			2.7E+05			2.7E+03			2.7E+05			2.7E+05
Aldrin ^c	0	1.3E+00	1.3E-01	1.4E-03	1.3E+02	1.3E+01	1.4E-01	1.3E+00	1.3E-01	1.4E-03	1.3E+02	1.3E+01	1.4E-01	1.3E+02	1.3E+01	1.4E-01
Ammonia-N (mg/l)	0	1.4E+00	2.1E-01		1.4E+02	2.1E+01		1.4E+00	2.1E-01		1.4E+02	2.1E+01		1.4E+02	2.1E+01	
Anthracene	0			1.1E+05			1.1E+07			1.1E+05			1.1E+07			1.1E+07
Antimony	0			4.3E+03			4.3E+05			4.3E+03			4.3E+05			4.3E+05
Arsenic III	0	6.9E+01	3.6E+01		7.0E+03	3.6E+03		6.9E+01	3.6E+01		7.0E+03	3.6E+03		7.0E+03	3.6E+03	
Benzene ^c	0			7.1E+02			7.2E+04			7.1E+02			7.2E+04			7.2E+04
Benzo(a)anthracene ^c	0			4.9E-01			4.9E+01			4.9E-01			4.9E+01			4.9E+01
Benzo(b)fluoranthene ^c	0			4.9E-01			4.9E+01			4.9E-01			4.9E+01			4.9E+01
Benzo(k)fluoranthene ^c	0			4.9E-01			4.9E+01			4.9E-01			4.9E+01			4.9E+01
Benzo(a)pyrene ^c	0			4.9E-01			4.9E+01			4.9E-01			4.9E+01			4.9E+01
Bromoform ^c	0			3.6E+03			3.6E+05			3.6E+03			3.6E+05			3.6E+05
Butylbenzylphthalate	0			5.2E+03			5.3E+05			5.2E+03			5.3E+05			5.3E+05
Cadmium	0	4.3E+01	9.3E+00		4.3E+03	9.4E+02		4.3E+01	9.3E+00		4.3E+03	9.4E+02		4.3E+03	9.4E+02	
Carbon Tetrachloride ^c	0			4.5E+01			4.5E+03			4.5E+01			4.5E+03			4.5E+03
Chlordane ^c	0	9.0E-02	4.0E-03	5.9E-03	9.1E+00	4.0E-01	6.0E-01	9.0E-02	4.0E-03	5.9E-03	9.1E+00	4.0E-01	6.0E-01	9.1E+00	4.0E-01	6.0E-01
Chloride	0													0.0E+00	0.0E+00	
TRC	0													0.0E+00	0.0E+00	
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00		1.3E+03	7.6E+02		1.3E+01	7.5E+00		1.3E+03	7.6E+02		1.3E+03	7.6E+02	
Chlorodibromomethane	0			5.7E+04			5.8E+06			5.7E+04			5.8E+06			5.8E+06
Chloroform ^c	0			4.7E+03			4.7E+05			4.7E+03			4.7E+05			4.7E+05
2-Chlorophenol	0			4.0E+02			4.0E+04			4.0E+02			4.0E+04			4.0E+04
Chlorpyrifos	0	1.1E-02	5.6E-03		1.1E+00	5.7E-01		1.1E-02	5.6E-03		1.1E+00	5.7E-01		1.1E+00	5.7E-01	

Jon VanSoestbergen@RCHMD@DEQ

From: Maynard D. Phillips@WPS@DEQ
Subject:
Date: Monday, September 28, 1998 8:45:07 EDT
Attach:
Certify: N
Forwarded by: Jon VanSoestbergen@RCHMD@DEQ

Forwarded to: Denise M. Mosca@KLMCK@DEQ
cc: Maynard D. Phillips@WPS@DEQ
Forwarded date: Monday, September 28, 1998 10:23:12 EDT
Comments by: Jon VanSoestbergen@RCHMD@DEQ
Comments:

Denise:

Following are Dale's comments regarding my 9/17/1998 memo and work on the Zapata wasteload allocation review and CORMIX analysis. If you include this e-mail as part of the file I don't see any reason to rewrite my 9/17/1998 memo. Could you please make a copy of the 9/17/1998 memo and attachment (24 pages) and send it to me. I forgot to make a copy before I gave you the package when you were here last week.

To address Dale's comments/questions:

Dale's explanation as to why the long diffuser is better should be adequate documentation regarding this issue.

The circular mixing zone I describe in my 9/17/1998 is as measured from the midpoint of the diffuser. CORMIX defines the origin of the coordinate (x-y-z) plane as this point. S (the hydrodynamic centerline dilution) is then as measured from this origin. Therefore, I believe my definition of the mixing zone as a circle measured around the diffuser midpoint is not incorrect. However, describing the mixing zone as extending from the diffuser in any direction is also acceptable, and would have the effect only of extending the boundary slightly further out in the y-direction toward the middle of the stream, in theory resulting in a slightly larger mixing zone. Practically, though, the difference between the two is of the order of 10 feet in the y-direction, which in the context of water quality monitoring and model accuracy is negligible. In any event, the final defined mixing zone will be a function of the final diffuser design submitted by Zapata. You should provide this final design to me for analysis when it is received, unless some sort of mixing zone analysis is provided as documentation with the design.

I will consider this e-mail as finalizing my 9/17/1998 memorandum and my work on this project. If you have any questions or need additional information, please don't hesitate to call me.

Jon.

To: Maynard D. Phillips@WPS@DEQ
Cc: Denise M. Mosca@KLMCK@DEQ
Curtis J. Linderman@RCHMD@DEQ
Bcc:
From: Jon VanSoestbergen@RCHMD@DEQ
Subject: Zapata CORMIX analysis
Date: Thursday, September 17, 1998 9:34:00 EDT
Attach:
Certify: N
Forwarded by:

Dale:

I am sending you the results of the CORMIX analysis I did for Zapata today. I have not yet sent the information to Denise pending your review. Please let me know if you have any concerns with the analysis. I will wait to send the package to Denise until I hear from you one way or the other.

In summary, I ended up analyzing two different diffuser designs. The first approximates the design that was included in the package provided by Denise, and the second is a design of my own. The first ("short diffuser") results in a dilution ratio of 50:1. The second ("long diffuser") results in a dilution ratio of 100:1. The mixing zone for the first is 25 feet, for the second, 20 feet. The ratio used by the permit writer will depend on the final diffuser design selected by the permittee.

As we discussed yesterday, I analyzed each design 1 hr before slack tide, at slack tide, and 1 hr after slack tide. Then I averaged the most conservative two results for each diffuser to obtain the final dilution ratio. This results in a dilution ratio based on a 1-hr average flow under critical conditions, which best reflects the way the acute standard is written. My recommendation is that the selected dilution ratio be used for both acute and chronic WLA determination.

Thanks for your help on this.

Jon.

MEMORANDUM


DEPARTMENT OF ENVIRONMENTAL QUALITY *Piedmont Water Regional Office*

4949-A Cox Road, Glen Allen, VA 23060-6296

804/527-5020

SUBJECT: Cockrell's Creek Wasteload Allocations and Dilution Analysis
Zapata Protein (USA), Inc. Discharge (VA0003867)

TO: Denise Mosca

FROM: Jon van Soestbergen 

DATE: September 17, 1998

COPIES: Dale Phillips, Curt Linderman

Per your request, I have reviewed the BOD wasteload allocations for the subject discharge to Cockrell's Creek. I also constructed a CORMIX model to analyze dilution ratios at the discharge associated with different diffuser designs. Two discharges (Ampro Fisheries and Zapata Protein) previously competed for the available assimilative capacity of the receiving stream, and previous models and analyses simulated both discharges to allocate wasteloads. However, the Ampro discharge was terminated. The purpose of this review was to determine if the BOD wasteload previously allocated to Ampro was available in part, or in total, to Zapata. The CORMIX analysis of a diffuser for outfall number 002 was performed to determine the dilution ratio for establishing wasteload allocations for conservative parameters.

BOD Wasteload Allocation Review

In September 1976, the Virginia Institute of Marine Sciences (VIMS) completed a mathematical water quality study of the Great Wicomico River and Cockrell's Creek. The model determined that an average of 5,000 lbs/day of BOD₅ would maintain water quality standards in the upper layer of the creek, which was the only layer used to determine the pollutant loading to the creek. Of this total, 4,900 lbs/day would be allocated to Ampro (then known as Standard Products) and Zapata.

My review of the available information leads me to conclude that the total allowable loading to Cockrell's Creek is 5,000 lbs/day of BOD₅, regardless of the point of discharge. Therefore, with the termination of the Ampro discharge, the entire 4,900 lbs/day previously allocated to the two discharges is available for allocation to Zapata.

CORMIX Diffuser Analysis

Zapata currently proposes to discharge through a total of four outfalls to Cockrell's Creek, but only outfall 002 was considered for a diffuser. The proposed discharge flow from this outfall is 0.300 mgd. The complex design of the diffuser included with the permit fact sheet can not be accurately analyzed using the CORMIX model. However, by simplifying the design somewhat, the expected dilution the diffuser will provide could be estimated. In addition to analyzing the design of this diffuser, a modified design was analyzed which affords better dilution in the near field.

Two diffuser designs were analyzed; one which closely approximates the design included in the fact sheet ("short diffuser") and one which affords better dilution ("long diffuser"). For each case, dilution was analyzed relative to one-hour averages under critical conditions, which most closely approximates the way the acute standards are written.

"Short Diffuser" - This diffuser design consists of a 12-inch diameter pipe extending 35 feet perpendicular to the east bank of the creek into water of approximately 5 foot depth. The diffuser line (the part with holes) starts 15 feet from the shore and extends to the end of the diffuser (20 feet). There are 13 holes of 4 inch diameter in the top of the pipe, and the end is blocked such that all flow is directed upward through the diffuser ports (holes). A rough sketch of the diffuser is attached.

This "short diffuser" design results in a dilution of 50:1 at the boundary of the mixing zone. This dilution ratio should be used to determine both acute and chronic WLAs for the discharge. The associated mixing zone boundary is 7.62 meters (25 feet) measured in a circle from the diffuser midpoint.

"Long Diffuser" - This diffuser consists of a 12-inch diameter pipe extending 60 feet perpendicular to the east bank of the creek, also into water of approximately 5 foot depth. The diffuser line starts 20 feet from shore and extends to the end of the diffuser (40 feet). There are 8 holes of 4 inch diameter, located such that flow will be directed in a 45 degree angle toward the water surface in the downstream direction during ebb tide. Again, the end of the pipe is closed so that all flow discharges through the diffuser ports. A rough sketch of the diffuser is attached.

This "long diffuser" design results in a dilution of 100:1 at the boundary of the mixing zone. This dilution should be used for both the acute and chronic WLAs for the discharge. The associated mixing zone boundary is 6.10 meters (20 feet) measured in a circle from the diffuser midpoint.

Conclusions and Recommendation

The BOD₅ wasteload available to Zapata Protein is 4,900 lbs/day.

If the "short diffuser" is specified, a dilution ratio of 50:1 should be used. For the "long diffuser", the dilution ratio can be increased to 100:1. This shows that different diffuser designs can result in dramatically different dilution ratios, and thus need to be taken into consideration when establishing wasteload allocations and permit limits. As such, it is important that the diffuser design be specified for a wasteload allocation based on a given dilution ratio. It is recommended that the alternate diffuser designs be presented to the permittee so that the advantages of each design can be considered. The designs presented should serve only as preliminary designs. The sketches provided herewith should in no way be construed as final diffuser designs. Alternate designs not yet considered are also possible, and can be submitted by the permittee for subsequent analysis using CORMIX.

Pertinent documentation for the CORMIX analysis is included herewith. Should you have any questions or need additional information, please do not hesitate to contact me.

Attachment:

Notes and Model Runs - Zapata Cormix Diffuser Analysis - Cockrell's Creek, 09/16/1998, 24 pages

ZAPATA CORMIX DIFFUSER ANALYSIS - COCKRELL'S CREEK

9.16.98

VA DEP - PRO J. VAN SOESTBERGEN

MODEL RUN SUMMARIES.

6 SEPARATE SCENARIOS WERE RUN TO OBTAIN AVERAGE DILUTION RATIOS RELATIVE TO THE ACUTE STANDARD FOR TWO DIFFERENT DIFFUSER DESIGNS. THREE SCENARIOS WERE NECESSARY FOR EACH DESIGN; AFTER-SLACK (FLOW UP THE CREEK), SLACK (NO AMBIENT FLOW), AND BEFORE-SLACK (FLOW DOWN THE CREEK).

TWO DIFFUSER DESIGNS WERE SIMULATED; SHORT DIFFUSER AND LONG DIFFUSER. SHORT DIFFUSER MOST CLOSELY REPRESENTS THE PROPOSED DIFFUSER DESIGN SUBMITTED BY THE PERMITTEE. LONG DIFFUSER IS A PRO-DESIGNED ALTERNATIVE THAT RESULTS IN BETTER DILUTION IN THE NEAR-FIELD UNDER EBB OR FLOW-TIDE CONDITIONS.

THE FILES ARE AS FOLLOWS

ZAPATA 1 : AFTER-SLACK ; SHORT DIFFUSER
ZAPATA 2 : SLACK TIDE
ZAPATA 3 : BEFORE-SLACK
ZAPATA 4 : AFTER-SLACK ; LONG DIFFUSER
ZAPATA 5 : SLACK TIDE
ZAPATA 6 : BEFORE SLACK.

ALL SCENARIOS WERE RUN USING CORMIX 2 ; I.E. A MULTIPORT SUBMERGED DIFFUSER.

DESIGN SKETCHES OF THE TWO DIFFUSERS ARE ATTACHED.

ZAPATA CORNIX DIFFUSER ANALYSIS

9.16.98

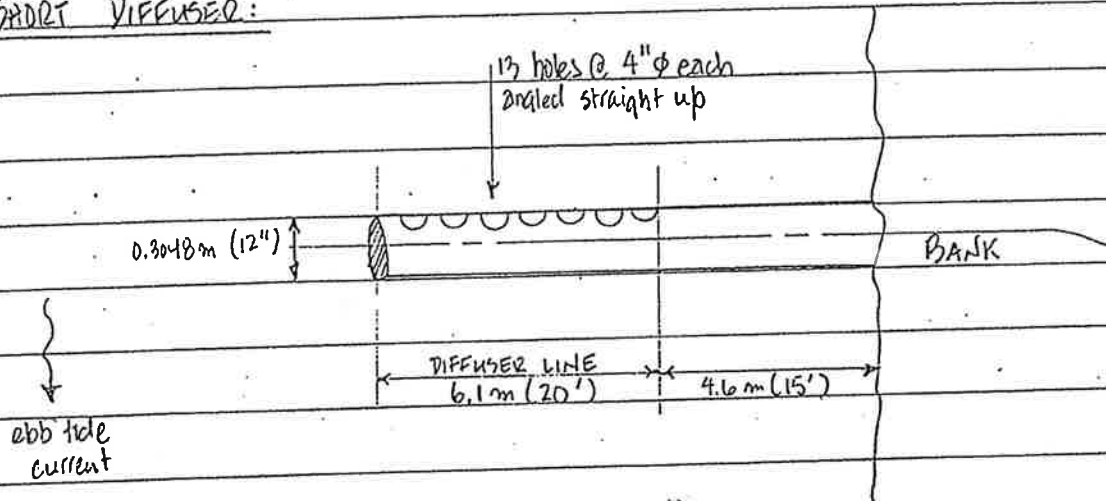
AMBIENT DATA

CHANNEL TYPE :	BOUNDED
WIDTH OF CHANNEL :	503 m
CHANNEL APPEARANCE :	FAIRLY STRAIGHT & UNIFORM
AVERAGE DEPTH :	1.524 m
ACTUAL DEPTH @ DISCH :	1.524 m
AMBIENT FLOW FIELD :	TIDAL REVERSING
PERIOD OF REVERSAL :	12.4 hr SEMI-DIURNAL
FLOW CONDITION :	① AFTER SLACK ; ② SLACK ; ③ BEFORE SLACK
TIME :	1.0 hr
INSTANTANEOUS AMBIENT VEL :	0.15 m/s
MAXIMUM AMBIENT VELOCITY :	0.30 m/s
MANNING'S "n" :	0.07
DENSITY CONDITIONS :	UNIFORM
FRESH OR NON-FRESH :	NON FRESH
AMBIENT DENSITY :	999.7 kg/m ³
WIND SPEED :	2 m/s

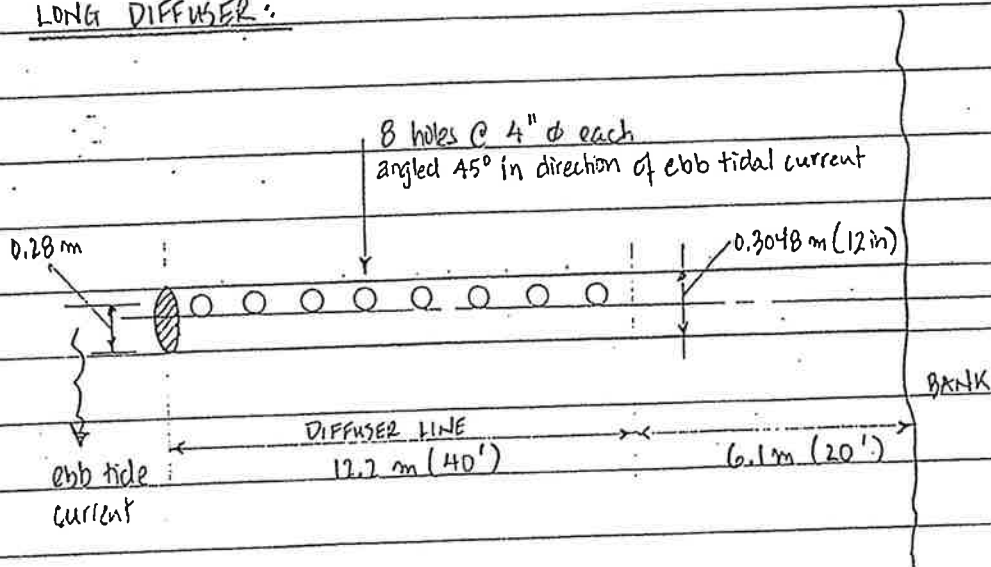
ZAPATA CORNIX DIFFUSER ANALYSIS - COCKRELLS CREEK

9.16.98

SHORT DIFFUSER:



LONG DIFFUSER:



ZAPATA CORNIX DIFFUSER ANALYSIS

9-11-98

DISCHARGE DATA

	SHORT	LONG
LENGTH OF DIFFUSER LINE:	6.1 m	12.2 m
BANK DIRECTION:	LEFT	LEFT
DISTANCE TO FIRST NOZZLE:	4.6 m	6.1 m
DISTANCE TO LAST NOZZLE:	10.7 m	18.3 m
ALIGNMENT ANGLE:	90	90
NUMBER OF OPENINGS:	13	8
SINGLE PORTS:	YES (A)	YES (A)
DIAMETER OF PORTS:	0.1 m	0.1 m
CONTRACTION COEFFICIENT:	1.0	1.0
HEIGHT OF PORT CENTERS:	0.3048 m	0.28 m
UNIDIRECTIONAL OR ALTERNATING:	ALTERNATING (B)	UNIDIRECTIONAL (A)
AVERAGE VERTICAL ANGLE:	-	90 45
RELATIVE ORIENTATION ANGLE:	-	90
SAME DIRECTION OR FANNED OUT:	SAME (A)	SAME (A)
HORIZONTAL ANGLE OF DISCHARGE:	-	0
DIFFUSER FLOW RATE:	0.0131 m/s	0.0131 m/s
FRESHWATER EFFLUENT:	YES	YES
TEMPERATURE:	27.7°C	27.7°C
HEATED DISCHARGE:	NO	NO
UNITS:	PPB	PPB
CONCENTRATION:	1000	1000
CONSERVATIVE SUBSTANCE:	YES	YES

ZAPATA CORNIX DIFFUSER ANALYSIS

9.16.98

MIXING ZONE SPECIFICATION

EFFLUENT TOXIC BY USEPA STANDARDS:	NO
AMBIENT WATER QUALITY STANDARDS:	NO
RME SPECIFICATION :	NO
MAX DISTANCE OF REGION OF INTEREST:	6,000 m
NUMBER OF OUTPUT DISPLAY STEPS:	10

ZAPATA COHIX DIFFUSER ANALYSIS

9.16.98

SUMMARY OF RESULTS

① SHORT DIFFUSER

FILE	AMBIENT SLENARIO	S
ZAPATA1	AFTER-SLACK	97.3
ZAPATA2	SLACK	5.8
ZAPATA3	BEFORE-SLACK	105.6

$$\text{CONSERVATIVE AVERAGE} = (97.3 + 5.8) / 2 = 51.6 \quad \text{SAY } 50:1$$

② LONG DIFFUSER

ZAPATA4	AFTER-SLACK	197.9
ZAPATA5	SLACK	5.1
ZAPATA6	BEFORE-SLACK	210.8

$$\text{CONSERVATIVE AVERAGE} = (197.9 + 5.1) / 2 = 101.5 \quad \text{SAY } 100:1$$

CORNELL MIXING ZONE EXPERT SYSTEM

Subsystem version:

September 1996

```

CASE DESCRIPTION
  Site name/label:      ZAPATA^VA0003867
  Design case:          AFTER^SLACK^SHORT^DIFFUSER
  FILE NAME:            cormix\sim\ZAPATA1 .cx2
  Time of Fortran run:  09/16/98--16:06:30

```

```

Bounded section
BS      =      503.00  AS      =      766.57  QA      =      114.99  ICHREG= 1
HA      =      1.52   HD      =      1.52
Tidal Simulation at TIME =      1.000  h
PERIOD=      12.40 h UAmag =      .300  dUa/dt=      .150 (m/s)/h
UA      =      .150  F      =      .334  USTAR = .3065E-01
UW      =      -2.000 UWSTAR= .2198E-02
Uniform density environment
STRCND=  U      RHOAM = 999.7000

```

```

DIFFUSER DISCHARGE PARAMETERS (metric units)
Diffuser type:      DITYPE= alternating perpendicular
BANK = LEFT        DISTB = 7.65 YB1 = 4.60 YB2 = 10.70
LD = 6.10          NOPEN = 13 SPAC = .51
DO = .100          AO = .008 HO = .30
Nozzle/port arrangement: alternating without fanning
GAMMA = 90.00      THETA = 90.00 SIGMA = .00 BETA = 90.00
UO = .128          QO = .013 = .1310E-01
RHO0 = 996.3187    DRHO0 = .3381E+01 GPO = .3317E-01
CO = .1000E+04     CUNITS= PPB
IPOLL = 1          KS = .0000E+00 KD = .0000E+00

```

```

FLUX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
q0      = .2148E-02  m0      = .2755E-03  j0      = .7123E-04  SIGNJ0= 1.0
Associated 2-d length scales (meters)
lQ=B    = .017  lM      = .16  lm      = .01
lmp     = 99999.00  lbp   = 99999.00  la      = 99999.00

```

```

FLUX VARIABLES - ENTIRE DIFFUSER (includes ENTIRE)
Q0      = .1310E-01  M0      = .1681E-02  J0      = .4345E-03
Associated 3-d length scales (meters)
LQ      = .32  LM      = .40  Lm      = .27  Lb      = .13
                                           Lmp     = 99999.00  Lbp     = 99999.00
Tidal:      Tu      = .0797 h  Lu      = 3.432  Lmin    = .137

```

```

NON-DIMENSIONAL PARAMETERS
FR0   =      5.44   FRD0 =      2.22   R      =      .85
(slot)      (port/nozzle)

```

[illegible]

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS

CO = .1000E+04 CUNITS= PPB
 NTOX = 0
 NSTD = 0
 REGMZ = 0
 XINT = 6000.00 XMAX = 6000.00

X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
 7.65 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.

NSTEP = 10 display intervals per module

BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 BH = top-hat half-width, in horizontal plane normal to trajectory
 S = hydrodynamic centerline dilution
 C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

Because of the strong ambient current the diffuser plume of this crossflowing discharge gets RAPIDLY DEFLECTED.

A near-field zone is formed that is VERTICALLY FULLY MIXED over the entire layer depth. Full mixing is achieved at a downstream distance of about five (5) layer depths.

Profile definitions:

BV = layer depth (vertically mixed)
 BH = top-hat half-width, measured horizontally in y-direction
 S = hydrodynamic average (bulk) dilution
 C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05
.76	.00	.35	34.2	.292E+02	.16	3.05
1.52	.00	.40	47.5	.210E+02	.32	3.06
2.29	.00	.44	57.4	.174E+02	.47	3.06
3.05	.00	.49	65.4	.153E+02	.62	3.06
3.81	.00	.53	72.3	.138E+02	.77	3.06
4.57	.00	.58	78.3	.128E+02	.92	3.07
5.33	.00	.62	83.7	.119E+02	1.07	3.07
6.10	.00	.67	88.6	.113E+02	1.22	3.07
6.86	.00	.72	93.1	.107E+02	1.37	3.08
7.62	.00	.76	97.3	.103E+02	1.52	3.08

Cumulative travel time = 101. sec

END OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

** End of NEAR-FIELD REGION (NFR) **

[illegible]

CO = .1000E+04 CON. j= PPB
 NTOX = 0
 NSTD = 0
 REGMZ = 0
 XINT = 6000.00 XMAX = 6000.00

-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
 7.65 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.
 STEP = 10 display intervals per module

 BEGIN MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

Initial conditions for individual jet/plume:

Average spacing between jet/plumes: .51 m

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.05	.05

 END OF MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

 BEGIN CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

Jet/plume transition motion in weak crossflow.

Zone of flow establishment:

LE	XE	THETA E	YE	SIGMA E	ZE
=	.00	=	.00	=	.30

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory

BH = before merging: Gaussian 1/e (37%) half-width in horizontal plane
 normal to trajectory

after merging: top-hat half-width in horizontal plane
 parallel to diffuser line

S = hydrodynamic centerline dilution

C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
Individual jet/plumes before merging:						
.00	.00	.30	1.0	.100E+04	.05	.05
.00	.00	.41	1.1	.877E+03	.06	.06
.00	.00	.52	1.5	.669E+03	.07	.07
.00	.00	.62	1.9	.526E+03	.08	.08
.00	.00	.73	2.3	.426E+03	.09	.09
.00	.00	.84	2.8	.353E+03	.10	.10
.00	.00	.94	3.4	.298E+03	.11	.11
.00	.00	1.05	3.9	.255E+03	.12	.12
.00	.00	1.16	4.5	.222E+03	.13	.13
.00	.00	1.27	5.1	.195E+03	.14	.14
.00	.00	1.37	5.8	.173E+03	.15	.15

Cumulative travel time = 7. sec

Merging of individual jet/plumes not found in this module, but interaction
 will occur in following module. Overall jet/plume interaction dimensions:

.00	.00	1.37	5.8	.173E+03	.15	3.10
-----	-----	------	-----	----------	-----	------

 END OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

BEGIN MOD232: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

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Vertical angle of layer/boundary impingement = 90.00 deg
Horizontal angle of layer/boundary impingement = .00 deg

Discharge into STAGNANT AMBIENT environment:

STEADY-STATE MIXING CONDITION IS NOT POSSIBLE in this zone,
even though some ADDITIONAL DILUTION MAY OCCUR!

Also, all far-field processes will be UNSTEADY.

SIMULATION STOPS because of stagnant ambient conditions.

END OF MOD232: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

```

** End of NEAR-FIELD REGION (NFR) **

```

SIMULATION STOPS because of STAGNANT AMBIENT conditions.

All far-field processes will be UNSTEADY.

[illegible]

~1004

```

CO      = .1000E+04  CUNIFS=  PPB
NTOX    =  0
NSTD    =  0
REGMZ   =  0
XINT    =  6000.00  XMAX   =  6000.00

```

X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
7.65 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP = 10 display intervals per module

BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
BH = top-hat half-width, in horizontal plane normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

Because of the strong ambient current the diffuser plume of this crossflowing discharge gets RAPIDLY DEFLECTED.

A near-field zone is formed that is VERTICALLY FULLY MIXED over the entire layer depth. Full mixing is achieved at a downstream distance of about five (5) layer depths.

Profile definitions:

BV = layer depth (vertically mixed)
BH = top-hat half-width, measured horizontally in y-direction
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05
.76	.00	.35	34.6	.289E+02	.16	3.05
1.52	.00	.40	48.4	.207E+02	.32	3.06
2.29	.00	.44	58.9	.170E+02	.47	3.06
3.05	.00	.49	67.8	.148E+02	.62	3.06
3.81	.00	.53	75.5	.132E+02	.77	3.06
4.57	.00	.58	82.5	.121E+02	.92	3.07
5.33	.00	.62	88.9	.112E+02	1.07	3.07
6.10	.00	.67	94.8	.105E+02	1.22	3.07
6.86	.00	.72	100.4	.996E+01	1.37	3.08
7.62	.00	.76	105.6	.947E+01	1.52	3.08

Cumulative travel time = 101. sec

END OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

** End of NEAR-FIELD REGION (NFR) **

[illegible]

CORNELL MIXING ZONE EXPERT SYSTEM

Subsystem version:

Submerged Multiport Diffuser Discharges CORMIX v.3.20

September 1996

```

Site name/label:      ZAPATA^VA0003867
Design case:          AFTER^SLACK^-^LONG^DIFFUSER
FILE NAME:            cormix\sim\ZAPATA4 .cx2
Time of Fortran run:  09/16/98--15:18:57

```

```

Bounded section
BS      =      503.00  AS      =      766.57  QA      =      114.99  ICHREG= 1
HA      =      1.52   HD      =      1.52
Tidal Simulation at TIME =      1.000 h
PERIOD=      12.40 h UAMax =      .300 dUa/dt=      .150 (m/s)/h
UA      =      .150 F      =      .334 USTAR = .3065E-01
UW      =      .2.000 UWSTAR= .2198E-02
Uniform density environment
STRCND=  U      RHOAM = 999.7000

```

```

DIFFUSER DISCHARGE PARAMETERS (metric units)
Diffuser type:      DITYPE= unidirectional perpendicular
BANK   =  LEFT      DISTB =    12.20  YB1   =    6.10  YB2   =    18.30
LD     =    12.20    NOPEN =      8      SPAC  =    1.74
DO     =    .100     A0     =    .008    H0     =    .28
Nozzle/port arrangement: unidirectional without fanning
GAMMA  =    90.00    THETA =    45.00    SIGMA =    .00    BETA  =    90.00
U0     =    .208     Q0     =    .013     = .1310E-01
RHO0   =  996.3187  DRHO0 = .3381E+01    GP0    = .3317E-01
C0     = .1000E+04  CUNITS=  PPB
IPOLL  =  1         KS     = .0000E+00    KD     = .0000E+00

```

```

FLUX VARIABLES -- PER UNIT DIFFUSER LENGTH (meters)
q0      = .1074E-02  m0      = .2239E-03  j0      = .3561E-04  SIGNJ0= 1.0
Associated 2-d length scales (meters)
lQ=B    = .005  lM          = .21  lM          = .01
lmp      = 99999.00  lbp      = 99999.00  la          = 99999.00

```

```

FLUX VARIABLES - ENTIRE DIFFUSER (metric units)
Q0      = .1310E-01  M0      = .2731E-02  J0      = .4345E-03
Associated 3-d length scales (meters)
LQ      = .25      LM      = .57      Lm      = .35      Lb      = .13
                                           Lmp     = 99999.00  Lbp     = 99999.00
Tidal:      Tu      = .0864 h  Lu      = 4.033  Lmin    = .174

```

NON-DIMENSIONAL PARAMETERS

FR0	=	15.95	FRD0	=	3.62	R	=	1.38
(slot)			(port/nozzle)					

[illegible]

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS

1 Kent 5/002 127

ORIGIN is located at the bottom and the diffuser mid-point:
12.20 m from the LEFT bank/shore.

BEGIN MOD201: DIFFUSER DISCHARGE MODULE.

Due to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 BH = top-hat half-width, in horizontal plane normal to trajectory
 S = hydrodynamic centerline dilution
 C = centerline concentration (includes reaction effects, if any)

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

BV = layer depth (vertically mixed)
BH = top-hat half-width, in horizontal plane normal to trajectory
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

Cumulative travel time = 40. sec

END OF MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

BEGIN MOD251: DIFFUSER PLUME IN CO-FLOW

phase 2: The flow has RESTRATIFIED at the beginning of this zone.

This flow region is INSIGNIFICANT in spatial extent and will be by-passed.

END OF MOD251: DIFFUSER PLUME IN CO-FLOW

```

: * End of NEAR-FIELD REGION (NFR) * *

```

3BEGIN MOD241: BUOYANT AMBIENT SPREADING

Discharge is non-buoyant or weakly buoyant.
Therefore BUOYANT SPREADING REGIME is ABSENT.

END OF MOD241: BUOYANT AMBIENT SPREADING

 BEGIN MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

```
Vertical diffusivity (initial value) = .935E-02 m^2/s
Horizontal diffusivity (initial value) = .117E-01 m^2/s
```

The passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

Profile definitions:

```

profile definitions:
BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
    = or equal to layer depth, if fully mixed
BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
    measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S  = hydrodynamic centerline dilution
C  = centerline concentration (includes reaction effects, if any)

```

Plume Stage 1 (not bank attached):

Plume Stage 1 (not bank attached):								
X	Y	Z	S	C	BV	BH	ZU	ZL
6.10	.00	1.52	197.9	.505E+01	1.52	6.12	1.52	.00
51.64	.00	1.52	171.2	.584E+01	1.52	6.97	1.52	.00
97.17	.00	1.52	180.0	.555E+01	1.52	7.73	1.52	.00
142.71	.00	1.52	201.2	.497E+01	1.52	8.42	1.52	.00
188.24	.00	1.52	228.7	.437E+01	1.52	9.05	1.52	.00
210.07	.00	1.52	243.4	.412E+01	1.52	9.34	1.52	.00

Cumulative travel time = 1400. sec

CORMIX prediction has been TERMINATED at last prediction interval.
Limiting distance due to TIDAL REVERSAL has been reached.

END OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

[illegible]